The relationships of material existence, time and experienced or experience-able reality.

Abstract:

A work that provides the metaphysical background that has been missing from physics. 3 premises are given, developed and supported with evidence. Definition of new terminology is given and used in explanations. A way of understanding both Foundational, existential, time and Emergent, experienced, time is set out. Defining and revealing the prevalence of Categorization error, Category differentiation error and Category omission error. Many puzzles and paradoxes are resolved. There is examination of truth values and the law of non contradiction in relation to objective material reality. Consideration of the accuracy of models of reality (maps). New terminology is introduced to categorize knowledge that has been found to be mistaken. Which will aid and ameliorate discussion of what is and isn't justified knowledge.

Introduction

Proposition and argument for a new understanding of time, material existence and experienced or experience-able reality. Evidence in support is given as; a statement of the sources of electromagnetic radiation, examples from the building and function of certain biological structures, exposition on the nature of the arrows of time and on the physical causes of 'McTaggart's like' A and B series of time, definition and identification of many examples, in physics, of categorization error. Categorization of certain terms is advocated, and new terminology is defined as required. Relation of the new understanding to truth values and the Law of non contradiction. The need to expose error but also for regard of formerly accepted models is addressed by; showing that a model can be both highly accurate in some regard and highly inaccurate in another regard, by adding the terms 'misinformed knowledge' and Justified Misinformed Belief (JMB) to 'stand alongside' Justified True Belief (JTB) in philosophy of science.

Basic Premises

1. Material existence has no time dimension. All parts are at the same singular time not extended over time.

2. Change of configuration of material existence is continual and necessary for actualization of the characteristics of material reality.

3. The speed of 'light' is not infinite but finite.

Expansion with terms

1. Material existence has no time dimension. All parts are at the same singular time not extended over time. (note: about being)

Definition of terms

[Relating to premises 1 and 2] Uni-temporal Now (-Now):

a) the temporal expression of the actualized, youngest configuration of all material existence. The corresponding material actualization and relations of parts within shall be referred to as the Object universe.

b) a unique pattern of the entire Object universe.

c) Signifying one foundational time; That is the same throughout the entire extant/ existing material (Object) universe.

d) It is the material (ideal) 'moment' between what has materially existed and what does not yet exist. (Uni-temporal Now is *not* between observed Past and a material, yet to be observed, Future.)

Expansion of concept of Object universe

The Object universe is the material universe [by definition]. Which continues to exist because it endures from configuration to configuration [change specified by premise 2.], and [it follows from premise 1.] has no parts spread over time. This fits the philosophy of endurantism,

"Endurantists believe that ordinary things do not have temporal parts; instead, things are wholly present whenever they exist (things persist by 'enduring')." Hawley, K. (2020)[1]

Definition

Actualization/ element of Object reality

That which is or has become actual or real, independently of information receipt and processing by an organism, device or apparatus. Pertaining to existing components of the source Object universe.

Existing actualizations fit the philosophy *of* Endurantism.

Noumenon

"A posited object or event that exists independently of human sense and/or perception.[bold emphasis added]. The term noumenon is generally used in contrast with, or in relation to, the term phenomenon, which refers to any object of the senses." Wikipedia Noumenon (2021)[2]

Beable

Something that primarily is, rather than an observable 'property'. It may be an Object, field or a characteristic of the material configuration, such as the setting on a dial. Allows distinction between physical and non physical quantities. For example a field is a physical beable. Whereas the associated potentials are not. (Bell, J. S. 1975)[3]

2. Change of configuration of material existence is continual and necessary for actualization of the characteristics of material reality. (note: about change)

Expansion of concept of change of configuration

Movement gives rise to forces that act to produce the resultant configuration (with continuing application of some forces, and also new resultant forces applying, and so on). Astronomic, macroscopic and atomic motions imply that it is reasonable to assert that no part of the Object universe is entirely static.. Even close to 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.

Antecedent notion

Heraclitus (500 BCE)

Heraclitus was a Greek philosopher from 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).[4]

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).[5]

It is a statement of opposites, of which Heraclitus seems to have had a liking. 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).[4]

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.

[Argument, evidence from biology, for sequential change]

Some example of the necessity of sequential processes

Imagine two separate collections of the same type and quantity of ions. One group has a random arrangement, the other has a specific arrangement forming an enzyme. The enzyme group now has a catalytic function not possessed by the other group, despite them both containing the same type and quantity of ions. The catalytic functionality comes from the shape and topology of the arrangement, not merely the ions present. The function of the enzyme has not appeared from nothing, it is a consequence of the sequence of assembly of the protein molecule, that leads to it becoming packed into a particular shape due to the forces between the constituent particles. For production of the sequence the configuration of material reality, the Object universe, must change sequentially. That allows the protein assembly, with a necessary sequence of steps, to occur. (Imagine threading beads on a string.)

Organization and structure does not make sense without sequential time allowing ordered construction and ordered processes; leading to function. When the steps in a biochemical process occur, in foundational Object reality, cannot be a matter of opinion. Each next step requires the preceding step.

There is also no reason for processes, such as functioning of the Krebs citric acid cycle and the Electron transport chain (that provides ATP for the biochemistry of life) in an eternalist space-time universe (as THE universe). Where everything **is** spread across space-time, without the necessity for processes to maintain material existence and life. Emergence isn't just the emergence of a structure from the relations and interaction of smaller parts or behaviours of simpler entities but is something new (in its own right), that is not predictable from the individual parts alone.

Egg shell:

The shell of a bird's egg is an emergent structure (no pun intended). The shape cannot be attributed to the calcium carbonate of the shell alone, from which it is constructed. Calcium carbonate from ground up oyster shell or Cuttlefish bone may be input to a bird (organized structure) and a beautifully formed eggshell is output. That egg form would not occur without the complex bird organism. It is a product of the organization of the bird and sequential process of egg production, from ingestion of raw material to egg laying, not just self-assembly of atoms. Taking the egg shell on its own, ignoring bird behaviour, reproduction and anatomy, its form cannot be satisfactorily explained. There isn't a good reductionist explanation.

Definition of terms

'A time' corresponds to a sequence of configurations of the Object universe (or -Nows). (That being so, an appropriate [size] scale and [time] span for the meaning of 'a time' should be employed to suit the kind of material circumstance considered.)
The sequential change in the material configuration of all existence, (the Object universe), is [by definition] Foundational passage of time.

3. The speed of 'light' is not infinite but finite.

It follows that, travelling at the speed of 'light' it takes time for 'light' (EMr) emitted from source material object at A to get to an observer at B.

Note on terminology:

It would be helpful, in physics, to use the words 'light' and 'electromagnetic radiation' or 'EMr waves', and the like, to represent different categories. Light for the seen light product of processing of received EMr; and 'EMr waves' and 'electromagnetic radiation' and the like, for the potential stimulus in the environment which might be input to an organism sensory system or a sensitive device or apparatus.

If the word ‘light’ is used to mean EMr in the environment, it can helpfully be indicated by using, ‘light’, rather than light. Recognizing the differentiation while still using the traditionally used word.

Colour could be helpfully reserved for products of processing EMr input. Which are correlated to wavelength but not directly corresponding. As the colour product also depends on; the processing that occurs, the proximity of other coloured objects, amount of illumination, the chemistry of the photo-receptors or senors or sensitive material used, and how the ‘light’ is being received, i.e. the relationship of the observer to the EMr input. The EMr waves in the environment (unseen) do not have colour, although they have the frequency and corresponding wavelength with which they were emitted from a source. Seen light is a quale (or qualia), a perceived phenomenon, and so categorically different from the unprocessed EMr input to a biological visual system, or processing device, or apparatus.
Using this categorization, the electromagnetic spectrum (in Object reality) is not defined as a spectrum of (seen) light. It is instead, the precursor energetic disturbances, EMr, that could potentially be converted into an Image reality light spectrum; that extends to non-visible light detection products at greater and smaller frequencies either side of the visible spectrum. This is a semantic aid to comprehension not an alteration of the physics.

Where do the EMr signals come from?

EMr signals are produced by emission from a radiating body (source) or by the interaction of EMr with substantial matter (source), leading to re-emission characteristic of the matter with which the EMr interacted. The EMr 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.
Biological photo-receptors are sensitive to intensity of EMr signals and have different sensitivities to frequency,. EMr signals have the potential to provide two kinds sensory information ‘about the source’. Intensity information related usually to level of illumination (but can also be due to the heat of very hot glowing objects, and amount of ‘cold light’ chemical luminescence) and frequency information related to the chemical composition of the source (and heat of hot object sources).

Experienced simultaneity*:*

Motion of an observer is a particular pathway through the electromagnetic radiation (within the uni-temporal environment), giving Image realities corresponding to the EMr received. Different relative motions can produce different apparent simultaneity, due to differences in when (during which configuration of existence) and where the EMr information is received.

The arrows of time

The arrows of time are not existentially real but esoteric consideration of the 'direction' of time.

Foundational arrow of time

This arrow is consequent from the sequence of change of the Object universe from oldest to youngest configuration. 'What is' being subsumed into the new 'what is'. Only the youngest in the sequence of configurations exists. The 'flight' of the foundational arrow of time is happening at the causality front. [A new term to aid in imagination of 'where' existence resides].

Definition

Causality front:

Where material change happens. It can be thought of as the boundary between the non-existent, Unwritten future and the existing configuration of Uni-temporal-Now.

The Object universe, unobserved, has a configuration Within that are properties and relations such as scales, masses, separations, relative orientations, and gradients, and fields. Which together with velocity and acceleration give the kind of changes identified as forces. That act to allow, constrain, or prevent change, to give the next arrangement,

in a continual sequence. Each configuration (and new set of associated relations) produced, is the next input enabling further change, according to the laws of nature.

*It is an irreversible arrow of time. This is the traditional '**direction**' of the arrow of time; What was, to what is, traditionally 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 singular sequence necessary for biological processes, chemistry and atomic and sub atomic physics.

<u>The Informational arrow of time</u>

At its most basic this is the order of receipt of sensory stimuli from which sensory information (electrical impulses) are generated and thence from which experienced observation products are generated. Or order in which signals are intercepted by a sensitive device or apparatus. If how the perceived direction of time is formed is considered, it is the Pre-written future (potential sensory inputs 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:

Signals in the environment ► Present experience ► Records/ memories.

(Though the brain does adjust the timing of the products, to give consistent causality stories, as described by David Eagleman (2010)[6]

This informational arrow is theoretically reversible, if the speed of the observer exceeds the speed of transmission of the signals (potential sensory inputs). However we can not do this for EMr signals. As we do not have the means to travel faster than 'light', EMr.

The Emergent (experienced) arrow of time

The third imaginary arrow is the arrow of time that is the experience of each Present succeeding the previous, giving the impression of ‘directional’ passage of time. It is the subjective experience of the sequence of products of one’s brain processing sensory information. Or the sequence of products of a sensitive device such as a video camera. As it relates to *product* rather than input, the informational and emergent arrows are not identical. The timing of events within the product can be subject to delays introduced during processing.

The difference between happening in Uni-temporal Now and the Present, observation product*:*

When a material body interaction or relation, (the actualized event), occurs is invariant as it belongs to a configuration, or a sequence of configurations of the material constituents of the Object universe. A singular uni-temporal Now or singular sequence of uni-temporal Nows.

When an apparent event is seen to occur is variable. Depending on when the EMr signals, emitted from the material body interaction or relation (the actualized event), is received. It is the electromagnetic input that is converted to sensory information. Which is processed by the brain and incorporated into a resultant Image reality.

Motion of an observer is a particular pathway through the electromagnetic radiation (within the uni-temporal environment), giving Image realities corresponding to the EMr received. Different relative motions can produce different apparent simultaneity, due to differences in when (during which configuration of existence) and where the EMr information is received.

Material reality is uni-temporal. The ‘image’ content of the seen Present is not. Emr emitted by a distant star, and Emr reflected from a nearby owl can be received together. The Present generated using the input thus temporal spread of content.

Seeing time reversal*:*

The third premise, the high but not infinite speed of ‘light’, explains why the observed Present observation products, formed from received ‘light’ cannot show time reversal. That would require travel of the observer to exceed the speed of ‘light’, to receive the EMr information in the order younger (more recently produced), to older (less recently produced). Rather than the obligatory, older to younger, order of receipt.

Faster than ‘light’ signal receipt would give the observed effect of events happening in reverse order. That is like playing of a film in reverse. Eggs could be seen to un-crack, and spilled water pour itself back into the jug.

(Apparent events generated from received ‘light’, (EMr signals), are distinct from the configurations of and interactions of material bodies; the sources of EMr signals.)

An experiment using sound and microphone bullets as proof of principle can be considered. Many handguns propel their bullets faster than sound. Shooting away from a sound source the signal would be received in the order more recently produced to older (produced earlier). With signal receipt in reverse the product experienced from processing of the signals would be reversed compared to the order of production of the signals. Of course, this aforementioned reversal is not travelling back in time. as the reversal of signal interception happens within the uni-temporal Object universe, with unchanging sequence of -Nows. It is reversal of perception of (or device’s detection of) events. And reversal of the experience of observation products, or (device’s output) manifestations. Meanwhile actualized events are occurring simultaneously within the continuing, normally ‘advancing’ foundational passage of time.

Time itself

In this explanatory framework it follows from premises 1, 2, and 3, and definitions and argument already given that; **Time is either 'bound to' the spatial configuration of the Object universe**, being temporal expression of it [premise 1, and 2, and related definitions], **or 'time' is the product of information processing** that possesses a time dimension; related to the material/ temporal origins of the information from which it is generated. Due to the transmission time of the EMr signals, from sources to observer [premise 3 and following argument and fact of where EMr comes from] **or the term 'time' can refer to the practice of timing.** Timing is event generation and counting using a device called a clock used for comparison with an event or events external to the clock**.** "In a fundamental sense we do not tell time but count events". (Clynch, J. R., 2003)[7] Counting events that have occurred in Object reality, of a particular kind, according to its type, is what a clock mechanism or other kind of workings does. A clock does not actually measure time. Faster and slower rates of change, that can be timed, correspond to more or less change happening to parts of the complete configuration of existence, the Object universe.

[It follows from premise 1 and 3,] Image reality (the Present, and other existing observation products) and Object reality (that which materially exists at Unitemporal-Now) are not equivalent and although co-existing do not have synchronized content.

Definition

Manifestation/ Observation product/ element of Image reality:

The seen or see-able product from the electromagnetic radiation (EMr), or other potential sensory signal, (the stimulus) input, and subsequently generated sensory informattion processing; by an organism or device.

A manifestation can be the conscious experience of a higher organism.

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 EMr or other potential sensory input and, via processes that occur, generates an observable product.
The seen Present is an observation product.
Elements of Image reality/ *manifestations of objects* fit the philosophy of Perdurantism. As they are generated from sensory signals that have taken different amounts of time to arrive together, (or close together), giving a temporal dimension to the product

Incidental facts

Visualizations can also be produced internally from memory and/or imagination. They can augment the mage reality, compensating for lack of information and gap filling, or appear superimposed upon it (hallucination).) Hallucination can be called ‘alternative Image reality’.
Virtual reality game imagery, text or symbols superimposed is called ‘augmented’ reality.

Definition

Reality Interface

In this explanatory framework a reality interface is organism's sensory system, device, system or apparatus that converts received EMr input or other ‘potential sensory stimuli’ that is unobserved, to different observed/ experienced, or observable/ experience-able product. *An interface between the underlying source reality and perception, of it;* imposing orientation and relative reference frame. It gives a limited fixed state product, that pertains to the information input from the environment.

Definition

Observer:

An organism, observation device or apparatus that receives EMr or other ‘sensory’ input. and generates an observation product by a process or multiple processes resulting from the input; according to type of reality interface.

The product has semblance to the external source (of the signal) material reality but differs in significant ways. The product has; surface appearance with no internal body or structure, temporal spread of content related to the origin of signal, possible distortion of form, due to conditions affecting transmission of EMr. That differing allowing it to be identified as product not source. Image reality, rather than observer independent Object reality.

The observer is or has a Reality interface, where inputs from external Object reality are processed into Image reality observation products. Objects that are not observers do not generate an observation product, though they can absorb input and re-emit some or all of it. Examples of observer devices are: camera, video camera, microphone and sound recording device, telescope, microscope, radio-telescope, X-ray machine.

Sensory signal receipt alone does not always determine the amalgamation that is produced. Complex processing modifies the sensory information, prior to product generation that leads to the experienced Present, in the case of the human Prime reality interface (most important reality interface for a human). I.e. the sensory system including Central nervous system. Likely also for all sentient higher being's reality interfaces. For example, the timing of the sequence of the input can be adjusted by the rain. Such as the coordination of ‘sound’ and ‘light’ signal information within a small range of temporal separation, (Eagleman, D. 2011) [6]. This extra processing aids

survival by providing coherent causal stories from diverse sensory input assisting with comprehension of the external environment and appropriate decision making. There is also significant filtering, and analysis of the received signals, prior to selected significant product being fed to the conscious faculty and appropriate decision making of the brain. Thus preventing overload and helping decision making by reducing availability to the consciousness of unimportant sensory products.

Blindsight provides evidence that sensory processing products can be generated without conscious awareness of them. Blindsight is subconscious sensory perception occurring in a person who has functioning eyes and optic nerve but cortical blindness. It is a malfunction of the primary visual cortex that prevents conscious perception of products of visual sensory processing. Subconscious awareness provided by the visual system can allow automatic responses, for example to a thrown object and successful automatic navigation of obstacles in the external environment.

Considering two kinds of time

1. Foundational time

The passage of time independent of observation; It is a temporal expression for the sequence of actualized, existing, uni temporal, material configurations of Object reality (pertaining to the configuration of the Object universe)

2. Emergent time

Emergent time: this is the time that is experienced or measured by an observer (organism, device or apparatus), via signal receipt.

The observer's 'Present' is formed from processing of the sensory information which is produced in response to receipt of stimulus signal input.

The seen, and otherwise sensed, product, the sequence of presents, is an emergent manifestation.

[it follows from premise 3], the sequence of Presents is not synchronized with the external reality, and so also not synchronized with the uni-temporal passage of time. As,

a)There is signal transmission delay, that increases with distance from the material source of electromagnetic radiation (EMr), or other stimulus, emission from the source object.

b)The motion of an observer also affects when and where EMr, and other types of stimulus signal is received and thus also the sequence of experienced 'Presents' produced.

Therefore,

it is informational and relative passage of time. The content of any observer's present depends upon the input received and processed, which varies for each observer rather than being what exists at Uni-temporal Now, external to the subjective experience. Sensory signals that have arrived at the observer location and received together, or over a short time is amalgamated. (The meaning of short depends on context. It may be seconds for a macroscopic observation or nights or weeks for an astronomic observation for example.)

For distant object sources the total transmission time will be longer but it will arrive together with signals from less distant sources; With shorter total transmission time. It follows that;

The observed Present, product, can contain images of objects in forms and relations that did not co-exist in material reality, because potential sensory information (emitted from the sources during different material configurations of existence/ the Object universe), that has taken different amounts of time to arrive can be amalgamated into the product.

Propensity for there to be disparity of signal transmission time affecting the product is greatest for astronomic observations, because of the magnitude of distances involved in

transmission from sources to observer. Light years or millions of light years for example. (A light year is the distance travelled by light in a year.) There may be evidence of this to be found in images of tilted galaxies. These structures can be very many (approximately 3000 to 300,000) light years in diameter. The EMr from the furthest away portion will have taken many light years of travel prior to emission of the EMr from the nearest to observer part of the galaxy, if they are to be received together. In which case the product ought not to be called [image of] an object. When it has **never existed** at one time as seen.

The long lifetime of stars and continuing birth of stars may obscure the age disparity. Perhaps old galaxies may show the appearance of a more aged nearer portion. As the EMr has been more recently emitted. The life span of the stars in comparison to the transmission time disparity will probably obscure the age difference.

It is often said that looking 'out into' space is like looking back in time. But what is seen is an amalgamation of received information from EMr signals emitted at different times. A material 4D object ought to be, all that it is in 3D at each time rather than partially 3D at many different times as, [it follows from premise 3. and the process of signal receipt and processing], are the manifestations, generated by the observing equipment.

For an inorganic device, it is objectively related to the information input and function of the device, or material.

For an organic observer there is additional processing making the product subjective; pertaining to the individual system, rather than just type, and its function as there is biological variation. For evidence of that see David Eagleman’s work (2011)[6] on observer calibration of delays for example.

McTaggart's arguments for Unreality of time

John McTaggart Ellis McTaggart, (McTaggart*)*, 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.

"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, called *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.)[8] "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)[9.]

Sequential in different ways

Both Foundational and Emergent passage of time can be described as sequences of configurations.

Foundational passage of time produces the singular sequence of material configurations that is the history of the Object universe. It can represented spread along a time line but only the youngest configuration has material existence. The time line is not a time dimension of the Object universe. The history of the Object universe is related to McTaggart's B series. As it is an unchanging order of events in sequence. Earlier than, and later than are unchanging.

Emergent passage of time is the sequence of products of an organic observer's sensory processing; a changing present of image configurations (and other sensations, sensory processing products) experienced as real.

Or it is, the sequence of products of an inorganic device, that has received EMr signal or other ‘sensory’ input, generating a product from it. Importantly for physics; time emergent from the processing of input signals, that are potential sensory information, allows non-simultaneity of same events, witnessed by different observers. Sense derived experience of an individual observer is related to McTaggart’s A series. Events can be ordered relative to the experienced Present. As Past, Present and Future. The temporal designation of events changes.

Foundational passage of time and emergent time provide B series-like and A series-like time. So as having both series was McTaggart’s necessary prerequisite for the reality of time, accordingly, *if that is sufficient*, time in this explanatory framework would be, by that argument, deemed real.

Analysis

Uni-temporal sequential change in configuration of Object-reality, provides the missing *unambiguous*, non-relative, unidirectional B series. That lies not along a time dimension but can be imagined along a historical time line of uni-temporal configurations. Strictly rather than reference to a present moment for the ordering of the series, sequential relation to material reality’s configuration -Now should be used.

The A series time can be understood as emergent, related to sensory information, receipt and processing. However, it does not fit McTaggart’s idea for each member of the series *having* the properties of past, present and future, as there are distinct stages in information processing. Those stages are; pre-receipt / processing (the Pre-written future), processing into (the experienced present) and post processing into records, including memories which are imperfect and plastic rather than fully accurate and

unchangeable. 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 McTaggart’s description). As; experienced moments are not within Object reality pertaining to the B series.

There is no universally experienced moment, and the present moment that is experienced *is not info-temporally homogeneous.* The information processed together into the Present can have had different amounts of travel time from the objects that emitted it. I.e. a present moment is perceived as a singular time but does not have a singular uni-temporal time origin.

The A and B series, like the arrows of time are useful abstract concepts. An argument has been given showing that the A and B series of time, are found in the contexts of *observation products and historical sequence of material reality* respectively. Despite the A series not being Object-reality (material reality). Nor the B series as it relates to what has been, and materially, earlier and later can not co-exist in the uni-temporal universe.

Aren’t Newtonian time and Proper time just the same as Foundational 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. “Isaac Newton founded classical mechanics on the view that s*pace* 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).[10]

Newton’s time is an eternal thing separate from the matter of the universe. In contrast to Uni-temporal Now (-Now) ‘time’ that is transient and synonymous with the transient configuration of the material and beable Object universe. Each time being a distinct configuration of the entire contents of the Object universe. It could be referred to as Object universal ‘Configuration’ time.

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 issue 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).[11]
“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).[9]

Definition

Proper time:

a)The time shown on an observer’s own clock considered at rest with the observer. When used with space-time, Proper time is measured along the ‘time-like world line’ taken.

b) “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”, Holster, A., (2016).[12] As clock time/ process time, Proper time is used for Classical mechanics.

Both Newton’s Absolute time and Proper time have the characteristic of being continual, uniform (according to the close observer in the same ‘rest’ frame of reference), unidirectional passage of time. They have those three characteristics, continual, uniform and unidirectional, in common with Foundational passage of time related to Uni-temporal Now (-Now) but are philosophically distinct concepts and so cannot be taken to be identical. Their similarities to Foundational passage of time related to Uni-temporal Now do not refute the requirement for proposition of Uni-temporal Now and Foundational ‘time’. [Note: The speech marks have been used as a reminder that it is not time as we are accustomed to thinking about it.]

Regarding Proper time; it is useful to separate timing with any kind of clock from ideas about what time is 'outside of timing’. A clock generates regular events which are counted, or could be. Which are used for comparison with other events or processes. Planetary motion could be used as the regular event. A time, according to this new explanatory framework, is a configuration of existence. Faster and slower rates that can be timed correspond to more or less change happening to *a part or parts* of the complete configuration of existence. It isn’t measuring passage of Foundational time.

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. Newtonian time also has the potential to allow paradoxes of time travel. Merely by the postulate of there being un-experienced time outside of Now. Uni-temporal Now is a temporal expression for a spatial configuration of matter and particles and foundational base existence. It is not to be considered separable, as something of itself, unlike Newton's absolute time.

Two futures

The Pre-written (potential) future

One 'future' is the not yet received sensory stimuli that already exists in the environment. It can be called the Pre-written future. The potential sensory inputs produced could be from spontaneous emission, reflection of EMr waves, the production of pressure waves which will be interpreted as sound, release into the environment of other potential stimuli, 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 stimulus, distance from source and environmental factors affecting transmission; transmission time for pressure waves and chemicals in the air can be affected by air currents, for example.

The distribution of EMr 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 potential stimuli has already occurred unobserved. A sub set of EMr, pertaining to a macroscopic event during which it was emitted, may be received and processed into the Present of one observer while EMr pertaining to that event has already been experienced by another, and may yet be 'still to be received' by more distant observers; and is in that regard their Pre-written future.

The events to which the Pre-written future pertain are fait accompli. Even if the potential sensory stimulus 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 information, obtained from the signal that travelled from it, 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 Unwritten Future

The other future (pertaining to material, beable reality) that is n*on-existent*: The imagined nothingness prior to actualization. That shall be designated the Unwritten future to contrast with the Pre-written future. This future is an imaginary, non-existent realm, not the source of material/ noumenal/ beable reality. The Unwritten future is necessary for partial non-determinism and free will. It can be imagined as what will be, but it doesn't have ontic, actualized or a phenomenal reality. As it does not exist there can be no time travel into that future. However, a human being, or other sentient being, can, working only in the -Now, with the imagined future as an aim, exert those physical and mental efforts necessary to actualize the imagined future later on; if the efforts are successful.

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 actualized 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 and creation of a multiverse. Those configurations not actualized remain as historical theoretical possibilities only. This is a very different concept to 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 that occur are inevitable.

Fate

An example for argument: A material event happens. In this example a random number is generated by a computer. Objectively, materially true.

Lets say each random number codes for an outcome initiated by the computer. Number [x] happens to code for a bomb exploding. If nearby observers 1 and 2 become aware of [x] prior to detonation they can take evasive or defusing action. They know [x] is determined.

For another, further away observer who has not received any sensory input about [x] it would seem the future is still open to a random outcome. The bomb explodes. It is not random but predetermined fate. As the ‘number is generated’ event has, material fact, already happened in Object (material) reality.

The Past

The object universe is continually changing, directed by 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. There is no material Past that has separate existence. There is no enduring material Past but there are imperfect and incomplete records, including memory (which is plastic and not fixed). Remaining relics, neural structure storing memory and material records, that all exist, are wholly within 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, youngest Now. Yet they allow some knowledge about former configurations and events; such as by archaeology and paleontology. And while the Past that created them no longer exists and cannot change, our understanding, our records, can; for example with new archaeological discoveries.

The Present

Present/ present-now/ here and now/ ‘now’; All the preceding terms are terms for the observed manifestation formed by an observer from received signals, that enabled generation of sensory information (electrical impulses or their inhibition). Which, through internal processing, produced experience and cognition of a semblance of external reality.

It should be noted that ‘now’ is not Uni-temporal Now. Uni-temporal Now is the material and beable configuration of the Object universe that is the source of all present or now manifestations; produced from signals emitted during that configuration, temporally preceding the Present manifestation.

The source of Present experience may be events occurring externally to the observer or reported to the observer in ‘real time’ such as a live TV show. The temporal delay between the recording of the material event and the observation of the ‘real time’ show ought, without technical problems, not alter the perception of it as occurring now’.

There will be ‘informational’ temporal spread within the product because of differences in Uni-temporal Now configuration in which the various signals received together originated. Signals from which the sensory information is generated, that is amalgamated into the product. This comprehension of the *emergent nature* of the Present and differentiation of it from Uni-temporal Now is far more precise and suitable for physics than the term ‘Present’ and ‘now’ as used in general parlance as synonymous with material occurrences.

Virtual Space-time

For visualization of the amalgamation of input: if the potential sensory information produced in each iteration *representing a discreet configuration* of Object reality is imagined a different colour, (rather than keeping in mind the ‘temporal’ origin, i.e. position in the sequence of iterations), it is easy to recognize that the reality that emerges

from processing of that information generated in response to the received signals is an amalgamation of ‘multi-coloured’ input pertaining to different configurations of the Object universe, an emergent, virtual (V.) space-time map.

The sense of vision that allows production and utilization of V.space-time maps is an important survival advantage for living organisms. That the map generated shows emergent V.space-time is just a consequence of its production resulting from received signals. 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. It is also a strong clue that what is seen is a representation and not external reality itself. As the size of external material objects do not change because of the location of the observer.

Colour discrimination provides a ‘survival advantage’ as it is helpful in differentiating source objects in the external world, such as food, predators, and mates. Colour seen, hue and shade, is a generated product. Not an objective characteristic of the source material object.

Non-simultaneity of events for different observers can be regarded as a difference in their emergent V.space-time maps that have been produced from sensory inputs obtained from the uni-temporal external reality. It is not an indication that the events witnessed in each observer’s present still exist as seen, in external reality.

Experiments, using computer simulations, will be able to show that V.space-time representations can be generated 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 virtual organism’s representation of its environment. Differences between the given environment and the representation produced will demonstrate that the two are not identical.

What is objective and what is observed

This section challenges the reader to think about the concept of objectivity and to examine the space-time and ‘subjectivity’ of observation products.

Describing *objective* reality.

The reputation of science rests largely on the notion that it is objective. Not the product of individual bias or imagination or error. However, ‘objective’ is used in different ways. Some things, such as physical constants and units of measurement, are deemed objective by convention. Not requiring corroboration. Corroboration of view can be used for ‘reality’ checking. Providing evidence for a reality outside of the mind of the individual. But corroborated subjective viewpoint is not truly objective.

"The close examinations of scientific practice that philosophers of science have undertaken in the past fifty years have shown, however, that several conceptions of the ideal of objectivity are either questionable or unattainable. The prospects for a science providing a non-perspectival “view from nowhere” or for proceeding in a way uninformed by human goals and values are fairly slim, for example."(Reiss, J., Sprenger, J., 2017) [13]

What is the world independent of us? The sum of all possible views does not suffice. That still relies upon the imposition of subjective viewpoints. More accurate description is a completely non-perspectival condition. The state of a measurable is always tied to how it is measured or viewed. i.e. seen this way...or if this is done...|NO single perspective ► no single state.

Beables: John Bell's use of the word ‘beable’ differentiates those things that are subject to observation or measurement, as opposed to those things that are as they are such as the arrangement of the apparatus, its calibration and settings. All existing things, are in their 'wild' condition as they are, without applied context and perspective.

Measurement: In order to conduct a measurement, what will be measured and how it will be done must be decided. Having established those constraints, there is now an observable (something that can be measured) on which the measurement relationship can be established. Resulting in a measurement state or value for the particular aspect of the observable, the measurable, selected for investigation. The measured state or value comes into being upon measurement. Its singular magnitude does not pertain to the beable object alone, unobserved. In this way there is differentiation between "wild" beables (that are as they are, unobserved), mentally constrained observable, measurable (particular aspects of the observable that can be measured), and measurements or observations (outcomes of the measurement process). Think of the observable as a collection of measurables, which may or may not be selected for measurement- rather than a "wild" entity. "Wild "meaning both unconstrained and of many possible values/states, like a wild card or Scrabble blank.

Objectivity of macroscopic reality:

The generalization that, macroscopic reality is objective, therefore observers should agree has dubious validity. If observer perspectives are similar enough, they will generate similar observation products from similar EMr and other sensory input. However, views can be dissimilar and give non-corroborating, contradictory opinions. (Subjective attention, focus, processing and interpretation are also factors that can give different opinions.)

The dimensions of Object reality

The configuration of the entirety of Object universe existing-Now is unknowable; including all that is existing, its extent, and configuration.

A truly objective Object reality is without any applied perspective. However, it is usual to consider material reality and material objects within it as having 3 space dimensions.

Perpendicular and of the same kind. That gives mapping of Euclidean space. The 'block universe' model has another dimension perpendicular to the others, giving traditional, four dimensional space-time.

The dimensions of observation products. A different mapping

Observation product spatial dimensions: Seen observation products, or those generated by a camera have a different arrangement of dimensions. There are 3 spatial dimensions. The virtual perspective space dimension goes directly away from the observer as it looks 'into the distance'. The height/vertical and length/horizontal dimensions are proportion spatial dimensions. Meaning an element of Image realities position on the perspective dimension will be proportional to the seen height and length. (If tilted away from the horizontal or vertical orientation, or if there is extent of the source object straight away from the observer, there will be corresponding size alteration along the perspective dimension.) The observation product's spatial dimensions do not form Euclidean space.

Virtual perspective dimension:

Professor Peter Corke, Professor of Robotic Vision at QUT, explains on the QUT Robot Academy web site, Reference[14,] that when there is perspective projection from the 3D [outside] world to a 2D image, one dimension is in his words, lost. Looking at the Human 3D perception page, a number of ways in which that 'lost' dimension is 're-imagined' are listed. "Occlusion, height in visual field, relative size, texture density, aerial perspective, binocular disparity, accommodation, convergence and motion perspective." (Corke, P,. 2020)[14] Each of these is explained on the aforementioned site. In these ways a virtual-spatial perspective dimension is perceived. Virtual in the sense of a virtual image that seems to be in space where the brain thinks it should be from the input received. Vertical and horizontal dimensions are actual spatial dimensions of the image. As the 3rd 'spatial' dimension of the image is virtual the imagined apparent 3D

space shown by the image is perpectival virtual V.space-time. That is also true of the seen Present. Which is also an observation product. And that differs between different observer perspectives.

Observation product time dimension:

As transmission time affects when signals are received and processed together into a present image or experience, Image reality observation products have a virtual time dimension. Rather than being perpendicular the transmission time dimension overlaps the perspective spatial dimension. Giving a kind of space-time, V.space-time.

The longer the signal has taken to get to the observer (the more change to the configuration of existence has happened) the more ‘out of date’ the V.space-time Image reality. Compared to what is at Uni-temporal Now, on the premise that change is continual. So the Object universe -Now can not be known by observation.

Perspectival virtual space-time, V.space-time:

The seen Present is not an image of a singular uni-temporal time. There is a virtual time dimension, in the same virtual orientation as the virtual perspective dimension. Related to transmission time of the signal from which the image is formed. The products are not 3D Cartesian, nor such Euclidean space with 4th time dimension, nor Minkowski spacetime. That circles in the external material reality can be seen as ovals and parallel lines be seen as converging, and foreshortening of seen 'objects' seem important, when thinking about what different observers of the same events will see.

Asteroid threat

The further away, the more ‘out of date’ the distance from Earth information. Obtained from EMr signals, emitted by the distant object. Like T Rex seen in the rear-view mirror (Jurassic Park, 1993)[15]. The warning: Objects in mirror are closer than they appear.

The asteroid Object reality is closer than the telescope Image reality, product of observation, shows. As the asteroid approaches the position of the seen likeness gets closer and closer to the position of the beable asteroid. The signal transmission delay is decreasing, leading to apparent acceleration of the detected manifestation of the asteroid. The decrease in transmission delay is not acceleration of the beable asteroid, as it exists independently of observation.

Higher level processing

‘Image reality’ pertains to products of all kinds of reality interface including radio telescopes and cameras. There are also different ‘levels’ of Image ‘reality’ due to the different amount and kinds of processing that happened to generate the product. Such as higher level 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. There can also be amalgamation of Image reality products to form representations. Such as panoramas, composite astronomic images, and Google maps.

When sentient organisms are considered, additional biological effects can be included, producing a ‘higher level’ (more processed) emergent reality.

This separates inanimate simple processing and organic processing that incorporates analysis that is influential on the product. This can include the co-ordination of visual and auditory signals occurring within a certain time interval, explained by David Eagleman (2011)[6], resulting in a coherent causal ‘story’. David Eagleman's work provides evidence that the Image reality produced depends upon the type of ‘reality interface’ and even the individual.

Optical illusions, evidence of internally generated visualization supplementing Image Reality

Certain optical illusions clearly demonstrate that the brain can fill what would be gaps in Image reality due to lack of information. Or, as recent research shows, for ease of processing. An experiment was conducted in which test subjects observed different orientations of black Pacman like shapes while undergoing fMRI testing. With an orientation of 3 of the shapes (missing segments facing inwards towards a midpoint between them), a triangle appears to be formed. Such an apparent but not actually existing triangle is called a Kanizsa triangle, taking the name of the Italian psychologist Gaetano Kanizsa who was the first person, on record, to describe the optical illusion, in 1955.

"Using fMRI, they discovered that the triangle –although non-existent – activates the primary visual brain cortex. This is the first area in the cortex to deal with a signal from the eyes. The primary visual brain cortex is normally regarded as the area where eye signals are merely processed, but that has now been refuted by the results Kok and De Lange 2014.)[16] "when the illusion was perceived, activity in cortical sites representing regions inside the illusory triangle was enhanced, and activity of sites representing the inducers suppressed.

In addition, activity increased in the cortical site representing a Pacman that was not part of the illusion. It appears that, depending on the precise cortical representation of the Kanizsa triangle, opposite neural effects occur that were overseen in prior studies as a result of averaging across neural regions containing both effects." (Bartels, A. 2014.)[17] This is evidence that 'reality', perceived by a human being, is processed product not external reality. Nor is it merely formed by receipt and filtering and amalgamation of information by the receptor cells and nerve transmission channels to the brain.

Definitions

Category mistake

“The error of assigning to something a quality or action which can only properly be assigned to things of another category, for example treating abstract concepts as though they had a physical location.” (lexico.com, Dec. 2021)

“... a property is ascribed to a thing that could not possibly have that property. An example is the metaphor "time crawled", which if taken literally is not just false but a category mistake.” (Wikipedia July 2015)

Definition

Categorization error: Failure to correctly differentiate Object reality and Image reality categories, or omission of a relevant category from consideration.

Category differentiation error: Failure to correctly assign different categories to the actualization, noumenon or beable and the associated manifestation or phenomenon, whereby it is known.

(Subset) Category omission error: Complete omission of consideration of a relevant category. (Woodward, G.)

Correct categorization **[Argument from categorization error definitions, and locating categorization error in physics]**

Object reality and Foundational passage of time and the physics of Image reality and Emergent time need to be differentiated. 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 objective physics is the environmental potential sensory information distribution, transmission and relation to an observer organism or device, determining the information that is received and when it is received; providing a *categorical difference* between source, material Object-reality and emergent image reality.

Unification; identifying the non-contradiction of classic relativistic and non-relativistic, sequential type time models

The two kinds of time; 1. foundational, sequential, uni-temporal, and 2. emergent, informational, relativistic, allow physics using sequential time and physics using Relativistic time to co-exist without there being incompatibility of the models. If there is recognition of to what the different kinds of time apply. 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 differentiation error (A type of categorization error) that fails to differentiate material objects and images of them; produced by the information receipt and processing of observers. Treating them as the same.

[Following from identification of the need for correct category differentiation]

Addressing Mach's principle

Mach's principle can be written in a number of ways. One version is: "Local inertial frames are affected by the cosmic motion and distribution of matter". S. Hawking & G. Ellis (1973).[20]

"You are standing in a field looking at the stars. Your arms are resting freely at your side, and you see that the distant stars are not moving. Now start spinning. The stars are whirling around you and your arms are pulled away from your body. Why should your arms be pulled away when the stars are whirling? Why should they be dangling freely when the stars don't move?" S. Weinberg (1972).[21]

Argument in reply:

"Mach-heavy [account of motion] involves the view that all inertial effects should be derived from the motions of the body in question relative to all other massive bodies in the universe. The water in Newton's bucket feels an outward pull due (mainly) to the relative rotation of all the fixed stars around it." Nick, H., Hoefer, C., Read, J. (Fall 2021)[21a]

Argument:

There is not spooky action from the distant stars on the spinning observer. Synchronicity of spinning stars sense impression and raised arms does not mean there is causation of distant stars influence on the person's body. Both the spinning stars sense impression and raised arms are a consequence of the person spinning. What is seen by the observer is the 'Image reality' observation product generated from EMr received from the local environment. What EMr is received when is affected by the motion of the observer. The raising arms are a consequence of the 1st Law of motion. As the person spins their arms raise up and outward from the body, as the arms try to move in a straight path but are unable because of their attachment to the body. That is the centrifugal fictitious force; Co-occurring with the observer generating the observation product from local receipt of EMr, affected by the spinning motion. A stationary view of the stars is generated from the local receipt of EMr when the observer is not spinning; Co-occurring with no centrifugal 'force', resulting in vertical hanging arms. So the person is spinning in an absolute sense compared to the *local* environment outside of the spinner.

Material person spinning….Object-reality

Spinning stars…..Image-reality | Can't influence force on material person.

Feynman's steak

"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)[22].

Although Richard Feynman acknowledges the difference between seen and actual steak he does not seem to appreciate the importance of clear differentiation of the different

categories of being/ happening that they are within physics. Necessary to avoid category differentiation error, a kind of categorization error, which can lead to category error (mistake).

Although they may bear the same object name, (such as ‘steak’) an actualized object of material substance and a seen image from EMr processing are not equivalent. We should beware of the ‘what you see is all there is’ fallacy underlying the belief that macroscopic reality is of fixed limited states and only relative perception (because that is what is observed). Rather, it is the absolute reality of material sources associated with, simultaneously, all the existing states that might be detected and gross information pertaining to many potential viewpoints that could possibly be observed, beyond impoverished individual perception.

Categorization error within ‘ON THE ELECTRODYNAMICS OF MOVING BODIES’ by A. Einstein June 30, 1905

[See in Einstein’s paper, under 2. On the relativity of lengths and times, the two operations (a) and (b)]

Methods

(a) “The observer moves together with the given measuring-rod and the rod to be measured and measures the length of the rod directly by superposing the measuring rod, in just the same way as if all three were at rest."

NB “directly by superposing the measuring-rod, in just the same way as if all three were at rest”

"In accordance with the principle of relativity the length to be discovered by the operation (a)—we will call it "the length of the rod in the moving system"—must be equal to the length l of the stationary rod." Quotes from Einstein, A. (1905)[23]

In scenario (a) it is the substantial object rod that is measured by superimposing measuring rod upon measured object, and the observer's Image reality that is formed comes from observing that superimposition of the measuring rod on the measured rod.

(b) “By means of stationary clocks set up in the stationary system and synchronizing in accordance with § 1, the observer ascertains at what points
of the stationary system the two ends of the rod to be measured are located at a definite time. The distance between these two points, measured by the measuring-rod already employed, which in this case is at rest, is also a length which may be designated "the length of the rod.” The length to be discovered by the operation (b) we will call "the length of the (moving) rod in the stationary system."...“This we shall determine on the basis of our two principles, and we shall find that it differs from l." Quotes from Einstein, A. (1905.)[23]

Comparison of methods:

In scenario (b) the observer is not measuring the object of material substance itself. The observer is receiving, and processing EMr emitted or reflected from the object (rod) to be measured. That is processed into an observation product image. It is where the image starts and ends at a time that is simultaneous for the observer that is determined by this method.

Comparing (a) measurement with (b) measurement is not comparing like with like. In (a) a material object is measured, and that measurement is observed. In (b) a manifestation (emergent image) is measured.

Einstein, A. (1905)[23]. wrote "Current kinematics tacitly assumes that the lengths determined by these two operations are precisely equal, or in other words, that a moving rigid body at the epoch t may in geometrical respects be perfectly represented by the same body at rest in a definite position". Was it true that "Current kinematics tacitly assumes that the lengths determined by these two operations are precisely equal"?

A. The assumption Einstein mentions requires that it is the substantial body (the material object) that is measured in both operations, and compared. However method (b) does not allow direct measurement of the object. There is now a categorization error because both (a) result and (b) result are considered to be comparable measurements. Whereas by method (a) an object is measured, and by method (b) an image is measured.

Considering the causal order of the measurements:

There are different causal orders of events giving the result by each method. The procedures cannot be equivalent and so the outcomes are not comparable without incurring categorization error.

Procedure (a) measurement method involves interaction with the object itself by the placing of the material measuring rod upon the substantial rod subject (of measurement) itself. That procedure is done before EMr from the ensemble is formed into an observation product, an Image reality. EMr signals that will generate sensory information is received together from both measured and measuring rods in juxtaposition. The measurement comes to be known by the production of the Image reality, an image of the scale and image of the measured object juxtaposed.

Procedure (b) the Image reality is formed before use of a measurement scale. Sensory inputs arriving together, from the selection made at the selected time, is formed into the image of the seen length. The spatial positions (points) corresponding to seen front and seen back are noted and then distance between is measured with measuring rod. The length is created from the way in which the sensory input is received and processed, and it is the length corresponding to the length of the seen observation product manifestation, not object, that is measured. This is a different, nonequivalent causal sequence of events.

Amalgamation of information: Remember, it cannot be assumed that the seen observation product image is necessarily identical to the material object. The image

displays only an aspect of the form. As it is formed from only the potential sensory input that is received. Observer viewpoint, and relative motion, can affect which potential input is amalgamated into the image. That allows sensory input with different temporal origin (from signals originating in different configurations of the Object universe) to be amalgamated, giving an image containing more temporal spread of information.

Is the moon there when I'm not looking?

"I recall that during one walk Einstein suddenly stopped, turned to me and asked whether I really believed that the moon exists only when I look at it." Pais, A. (1979).[24] Einstein was questioning belief in quantum mechanical systems without objectively real properties that exist independently of observation. It was perhaps an attempt to highlight the philosophical consequences of such beliefs. It can be demonstrated that the moon can in some sense not exist because of lack of information receipt but at the same time still exist in a different way.

That title question fails to distinguish between all of the following: the knowledge/ concept of the moon, the substantial moon object, a manifestation of the moon (formed by an observer's sensory system or product of a monitoring or recording device), potential sensory input (EMr signals) pertaining to the moon in the environment and EMr signals pertaining to the moon input to a device or organism's sensory system.
It can be seen by the following argument that the question 'is the moon there when I'm not looking' is inadequate. It is inadequate because the category of moon; Moon source object, Moon related potential sensory input, Moon manifestation or Moon-concept has not been specified, an unspecific noun, 'Moon', has been used.

KEY
A- Actualized, a substantial element of reality
Ab- Absolute, no singular reference frame applied
Categorization error- Failure to correctly identify or discriminate between different kinds of element of reality belonging to the different facets of reality
D- Definite. Certain and un-altering in that respect)
EOIR- Element of Image reality
EOOR- Element of Object reality, not same as objective reality
FS- Fixed state. A selection giving one un-altering state
Gross Set PSD- Total potential sensory inputs in the environment emitted by an actualized source object
Image reality- Emergent reality, product from sensory inputs or measurement processing, Individual observer specific, or objective via shared product or shared source of sensory input
L- Limited (partial sample)
MS- Mixed state. A selection containing more than one state
M- Manifestation. Experienced product of sensory information processing
Object reality- Foundational, source reality of substantial objects and particles and potential sensory inputs
Objective reality- Multi-observer corroborated Image reality
PSD- Potential sensory input. EMr with the potential to cause generation of sensory information when received by suitable system.
oMoon-Material source object Moon
PSDMoon…EMr info. pertaining to oMoon
iMoon…Product of EMr processing, an image
PSYMoon… Concept/idea of Moon in thought and/ or records including memory

Solution

(Ab A S EOOR) oMOON ≒ (Gross Set A PSD) Moon

Absolute Actualized source object

Total potential sensory data in the environment pertaining to oMoon

(Ab A S EOOR) oMOON ≒ (D LFS PSD) Moon

Definite Limited Fixed State sub-set of EM signals received by observer

Absolute Actualized source object

(Ab A S EOOR) oMOON ≒ (D LFS M EOIR) iMoon

Definite Limited Fixed State manifestation of Moon (iMoon)

Absolute Actualized source object

When not looking: there is no (D LFS PSD) Moon, the sub set of potential sensory inputs received by the observer (because no receipt is occurring), and there is no (D LFS M EOIR) iMoon, manifestation, product. However, within Object reality, there is still (Ab A S EOOR) oMoon; The Absolute actualized object. There is also still, within Object reality, (Gross Set A PSD) Moon; the total potential sensory inputs in the

environment emitted by moon. The substantial actualized object and total potential sensory inputs in environment relating to Moon object, can exist without their Image reality manifestation counterpart. Likewise, the concept of the Moon, PSYMoon, within brain activity or mind, stored within connected neurons as memories and as information within books and other kinds of records exists independently of a currently observed image manifestation (the moon in night sky seen 'in the Present'.) The concept of the Moon does not require the formation of the seen image for its continued existence. (Ab A S EOOR)oMoon and (D LFSM EOIR)iMoon belong to different categories of elements of reality, belonging to different facets of reality.

Examining the Light clock argument

The Light clock is one of Albert Einstein's thought experiments. It consists of a pulse of light that is bounced between two mirrors. One return journey, up to the top mirror and back, is one 'tick' of the clock. When the clock is moved laterally, it will seem that the light must travel further, diagonally, between the mirrors. Pythagorean mathematics can be used to calculate the apparent difference in distance travelled by the seen light, according to a stationary observer of the moving Light clock system, compared to distance when it is seen to be stationary. The distance between mirrors of the material clock is known, as is the distance translated. Using These measurements two right angled triangles can be formed. With Pythagoras theorem; 'the square of the hypotenuse is equal to the sum of the squares of the other two sides', the length of the hypotenuse representing the diagonal path can be found. To go further at the same speed of 'light' in one clock tick, the 'time' given by the ticks must slow down. From this argument comes the saying "moving clocks run slow".

Counterargument:

Only what would have been observed was considered. So, there has been a category omission error in the original thought experiment. EMr within the Light clock cannot be travelling further within the clock in Object reality, because of the way the Light clock is observed. There must be one and the same physics occurring in the clock that is the source of different observation products. It will be argued that; the time measured by the clock itself, is not slowed by the translation (translocation) of the clock, as argued by Einstein. The period and frequency of the 'light', EMr, ought to be, theoretically, according to the alternative explanatory framework, unaltered in Object reality (traveling the same wave motion distance in the same time) ,unless there is a material cause for slowing. Which will be proposed.

Periodicity and the Light clock

The categorical difference between seen light and the unseen causal actualization in the external environment is very important and deserves reiteration. To avoid ambiguity, it would be useful if in physics the term, light, is used to refer to the seen product of EMr receipt and processing; and electromagnetic radiation (EMr) is used to refer to the causal actualization within the external environment. EMr is not seen light, it is not seen while still in the environment.

Light appearing to be in the external environment is an image product generated by the observer, organism or device, from receipt and processing of EMr. This is knowable, because how vision and devises such as digital and film cameras function is known to science.

The diagonal light path seen has to be a product from processing of 'light' scattered from the EMr pulse that travels to the observers' locations, not travelling between the material mirrors. This is necessary because of the way in which vision works. It is necessary for EMr to be received by an observer organism, device or

apparatus, for an image of the source to be seen, or knowledge of the tick time to be obtained.

What would be happening in the clock? It is very important for uniform/ the same physics occurring in material/ noumenal reality, that the distance travelled by the 'light' (EMr radiation) in the imagined material light clock is the same in foundational Object reality. Regardless of moving and stationary scenarios; being unaffected by observations. There is one source reality. The EMr must be travelling the same distance between the mirrors, with the same speed and period, giving the same number of vibrations and ticks, during all observation protocol. Remember this is not what is seen but what is happening in an imagined material light clock.

Concerning the vertical motion of the EMr; The mirrors are **always** an equal distance apart and not displaced in Object reality. A diagram of a diagonal path between displaced mirrors is never representing a uni-temporal Object reality.

As the configuration of all existing, Object reality, changes, (which might be called, 'as foundational time passes') the vertical motion of the EMr pulse between mirrors, the invariant period and number of cycles, is sequentially distributed along the horizontal direction of translation; as the EMr moves, if the translation is considered. This does not mean that the EMr has taken a longer path *between the mirrors* when the translation is taken into account. As the distance between mirrors never changes.

When just mathematics is considered, period is invariant under translation. The magnitude of the cycle does not change, so at the same speed it takes the same time to complete that cycle. Consider one tick as one cycle. Compare with one full rotation of a mark on the rim of a jacked up, from on the ground wheel. Then consider, as the lowered wheel rolls along the ground. The circumference stays the same. So too for a jacked up wheel rotating at the same speed on the back of a speeding lorry. So the cycle is the

same, and at the same speed of rotation the period will be the same. A component of the translation is not added to the circumference. The wheel rotation cycle distance is independent of the amount of horizontal translation of the mark, and of the length of the arc(s) of its motion, taking into account both vertical and horizontal motion.

This explains why the speed of light on a speeding train is still just the speed of light. The period of vibration of the light is unaffected by the translation. The different kinds of motion, the periodic motion and translation motion must be treated independently, Not added arithmetically or as vectors. This also explains the constancy of light speed in Object reality when moving away or towards the Emr source.

The Image reality, (What would be seen)

To be seen EMr must reach the eyes of the observer so the Central nervous system can generate an image, observation product. Likewise for a camera or radio receiver observer. EMr must be received at the observer location, that was issued at the clock source, in order for an observation product to be formed. The EMr bouncing between the mirrors does not reach the observer, so isn't seen. EMr scattered from the pulse does reach the observer. The image reality generated by the observer is not the Object reality occurring inside the clock. The same interrelation would apply if instead of vision the observers used the sending and receiving of radio signals from clock to observer.

For the stationary observer of a stationary clock; and a co moving observer of a moving clock the relation of observer to clock is constant. It takes the same length of time for the EMr to travel from light pulse source to observer, as time passes. For the stationary observer of the moving clock, the relation is changing. As the clock moves further away it takes longer for the scattered EMr to reach the observer, according to distance. The generated image or representation of the moving clock, can give the impression that the material clock is running more slowly, due to an increased

delay in signal receipt. Meanwhile, with the observation of a stationary observer of the clock, and for a same speed co-moving observer, for whom the clock apparatus appears stationary, the tick must be constant and unchanged.

Each observer makes their own observation products using the EMr received at their location,, which depends upon their and the clock's relative motion. No paradox.

Emphasizing the emergent nature of sensed phenomena: It is impossible that the seen light path is actually seeing the path of the EMr bouncing between the mirrors. The seen or made see-able (by device or apparatus,) is a new product, not preexisting in foundational, beable, noumenal reality. The observer organism, device or apparatus is required for its production. I have referred to such things, elsewhere as reality interfaces. Input is received from foundational reality by them and an emergent 'reality' is produced. The sensed and experienced Present is an amalgamation of emergent products, not foundational reality. Each observer is not seeing different present slicing of an external space-time continuum.

Using the classic, seen, diagonal light path argument: To go further at the same speed of light in one clock tick, the 'time' given by the ticks must slow down. From this argument comes the saying "moving clocks run slow".

It is not correct to say that *due to Relativity* "a moving clock runs slow". Observer generated clock tick perception is not the cause of actual slowing of tick of a material clock. The Hafele Keating, clocks on planes experiments (and more accurate versions) show there is alteration of the amount of elapsed time measured, related to the amount of its (quasi) *absolute* distance travelled. (Quasi as the center of the Earth is taken as a stationary reference, (not observer), in the Hafele Keating experiments, but has other motion not just rotation.) As well as speeding up due to altitude.

These are changes to the material clocks, a change of Object reality. Not relative perception, due to different observer reference frames (Special relativity), or due to production of different observation products; (Image reality effect.) This could be accounted for by variation in the density of base existence. Less at altitude and more encountered with quasi absolute motion. This might affect the event generating vibrations of the caesium atoms, affecting the vibration of the timekeeping quartz crystal.

Source. Adapted from, Woodward, G. (2017). Examining the Light Clock Argument, Clocks on Planes, Wavelength and Doppler Shift, in Relation to Object and Image Reality. viXra:1703.0030 [pdf]

The concept of wavelength

Definition: 'Wavelength: noun, Physics. The distance, measured in the direction of propagation of a wave, between two successive points in the wave that are characterized by the same phase of oscillation.' Dictionary.com[25]

Wavelength is a spatial distribution measurement that combines position due to periodic motion and linear translation in the direction of propagation. The amount of linear translation *measured* can vary according to observer location and motion, and observed frequency is inversely proportional to observed wavelength.

It can be understood from the earlier investigation into the Light clock and plane experiment problem,

that the periodic actualization in Object reality is not altered because of the change in relation of it and the observer, unlike observed wavelength and frequency.

Doppler shifts can be thought of as changes in the relation of an observer or Reality interface to the potential sensory information produced by a source. Decreasing distance between source and receiver gives an increasing frequency of wave interception. As each wavelength is emitted it is closer to the observer than the previous emitted wavelength reducing travel time The observer is is also receiving more recently emitted EMr signals, than if the distance between source and recipient was not altered. Increasing distance gives an increasing delay in receipt, a decreasing observed frequency. As each wavelength is emitted it is further away from the observer than the previous emitted wavelength increasing travel time.

The observer is also receiving less recently emitted EMr signals, than if the distance between source and recipient was not altered. This means there is not only a shift in frequency of the product but a shift in temporal origin of the signal (and information contained) from which sensory information, and thence experience and cognition, is generated. From this it can be understood that the frequency measurable is a characteristic of the relation between observer and the observed wave actualization in Object reality. In this way observers with different relations to the same wave actualization in Object reality can measure different frequencies.

The stubborn illusion and causality

In a letter to the family of a recently deceased friend, Einstein wrote; “To us believing physicists the distinction between past, present and future has only the significance of a stubborn illusion.” (Cited in E= Einstein 2006 p34.)[28]

From the preceding discussion of the ideas of futures, past and present:
There is a categorical difference between the existing material -Now, and other times.

Therefore, there must be a different way of thinking about causality, rather than considering causality linked to an observer's world line through the space-time continuum.

Considering causality or cause and effect:

What is happening *unseen* in uni-temporal Object reality is material, noumenal, universal causality in action. The continual 're-arrangement' of the material of the uni-temporal universe. Material objects can directly have effect upon each other when they meet each other in the same configuration of existence. Fields and waves can mediate between material objects that are separate. For example, a boat rocked now by the wake of a boat produced then.

The way in which sensory information is generated in response to receipt of signals from the external environment is the cause and effect of observation; the relationship by which knowledge about the external world is obtained. This latter cause and effect is identifiable as different from just change of configuration. This second kind of cause and effect is a part of the first kind. As the observer and the signals received are parts of changing Object reality configuration.

The generated product sequence seen is not necessarily identical to the material cause and effect sequence that was the source of the images. It can be affected by; distance from the sources of the various signals received that are amalgamated, effects on the signals in transit, and effects of processing.

The paradoxes of Relativity

A paradox is a logical contradiction. The paradoxes of Relativity, though much beloved by physicists and the general public, are shown to be due to one common error. Rather than the 'World' itself being paradoxical.

The Grandfather Paradox

The idea of time travelling, 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 traveller goes back in time, kills his own grandfather so his father is not born and so is unable to father the time traveller. Therefore, the time traveller cannot travel back in time to kill the Grandfather. Another version of the paradox is called Autoinfanticide, in which the time traveller kills himself as a child.

A number of possible solutions have been suggested. Such as the time traveller jumping onto an alternate Past when arriving back in time. So, it isn't his own Grandfather that is killed but another version. Or by 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. There being a physical rule that prevents changes occurring that will alter time have been suggested by others. That 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, described by Laura Sanders in 'Physicists Tame Time Travel by Forbidding You to kill Your Grandfather', Wired, 20 July (2010)[29] 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 provides the necessary physical background for the Grandfather paradox, and other paradoxes, to be possible.
An alternative description follows.

(Ab A EOOR) Grandpa ≠ (D LFS M EOIR)Grandpa
Grandpa material object Grandpa image manifestation

The EMr signals within the environment, can be differentiated from the Object reality of material source objects now existing. Matter, photons and other potential sensory inputs distributed within the environment co-exist within Object reality.
The Grandfather paradox is based upon the assumption; that non-simultaneity of events experienced by different observers of the same event requires
endurance of physical (meaning, relating to real objects) events in time. Rather than just endurance of the potential sensory inputs from which to construct Image reality Present experience. It confuses Image reality with Object reality.

The Grandfather paradox is therefore based upon a categorization error (category differentiation error). That there is non-simultaneity of experienced same events, should not be used to suppose that the object sources of the potential sensory inputs received must remain unchanged. As the Image reality product depends only upon the receipt of EMr signals (with potential for the generation of sensory information), already emitted into the environment. The pool of EMr signals allows different observers to receive and process radiation into different products; Location and motion relative to the EMr (potential sensory inputs) in the ‘Data pool’ determining what input is received.

The EMr potential sensory input is not the material Past, Present and Future; only the potential to enable forming of Image realities, with semblance to prior existing objects and events, when received and processed. The object sources can change, move, or cease to exist after the EMr is emitted. The no longer materially existing, is

unambiguously, different from that which materially exists and that which has not existed. EMr signals (potential sensory inputs) persist in the environment, receivable by different observers at same and different times, allowing non-simultaneity of the same events that are seen. There is no need to suppose there is a space-time continuum in which events as physical realities persist throughout all time.

It is not necessary for physics that material events themselves persist. It is likely they do not persist, as doing so permits paradox. With uni-temporal space containing distributed EMr information rather than the Space-time continuum, the possibility of time travel and all Causal loop or Bootstrap paradoxes are also eliminated. So too is the possibility of a working Tachyonic antitelephone.

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.

“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.)[30]

The Andromeda paradox is dispelled by realizing there is a significant category difference between what is experienced as a present event through receipt and processing of EMr information including the potential for such experiences, and events in which 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. (See Fate p17)

Potential sensory inputs are 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 means to form observable manifestations exists prior to their being experienced.) The Object reality or source reality, and Image reality experienced Present manifestation are not synchronized.

When an event is observed via its manifestations (or potentially could be, as in this paradox) is variable, according to observer location and motion; The observer walking towards Andromeda is getting closer to the EMr that has potential for the generation of sensory information pertaining to the invasion, from which a Present experience could be formed, compared to an observer walking away. Even though they are too far away to receive the radiation that could enable generation of potential sensory information pertaining to the invasion. So even though no invasion signal is yet received, as Andromeda is too far away, it can be said that for the observer walking towards Andromeda, the potential sensory inputs emitted from the invasion events on Andromeda are spatially closer to him. As he is reducing the distance the signal has to travel to meet him. If close enough, 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.)[30]

If for one ‘observer’ the event has happened in Object reality, and EMr signals (with potential to enable sensory information generation) pertaining to the event is in flight; it has happened for both. The launch 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 launch event occurred, EMr signals will have been produced by reflection/ emission.

The proximity of the particular signal to an observer does not alter the material event, only when the 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 launch event in Object reality is true simultaneously for all locations. It has happened, so that is certain, determined. Though the distant observers do not yet have the information that would give them awareness of the occurrence.

Reference Penrose, R. (1989). The Emperor's New Mind: Concerning Computers, Minds, and the Laws of Physics. Oxford. Oxford University Press. p. 392–393.[30]

The bug- rivet and barn- pole paradoxes

A paradox of special relativity; the bug- rivet paradox is about a rivet too short to squash a bug at the bottom of a hole accelerated to near ‘light’ speed. The different reference frames of the bug and the rivet produce two different estimations of the rivets length and ability to squash the bug. From the bug’s reference frame, it is far too short for squashing but from the rivet’s it is long enough. The different opinions on length are due to non-simultaneity of seen events in the different frames of reference affecting what is seen where and when.

Bugs can't be squashed because of the perspective given by a manifestation, an image. Only the actualized objects’ dimensions, those of the material rivet and bug in hole can squash it. The relative positions of the parts of rivet and hole are theoretically experienced differently for the different 'observers'. If they were both capable of being observers- they would be fabricating different experienced Presents from the sensory inputs available at their location. A rivet is not such an object. It is not, nor does it possess, a Reality interface that can convert environmental signals into a perceived product.

Background argument:

Amalgamation of information from inputs, pertaining to different source (environment and configuration) origin, by each observer into what is seen, produces different experienced Presents. That are within the same absolute foundational time, Uni-temporal Now. The individual, information derived products do not affect material objects, that are not within the perceived V.space-time product but are always only within Uni-temporal Now, the existing configuration of the Object universe. What will happen is the material objects, (material with a hole in it and the rivet), that are *sources* for both reference frame perspectives will come together in relation to their material object dimensions. The different reference frame perspectives will not be relevant to the material interaction.

Categorization error in ‘On the electrodynamics of moving bodies’, Einstein, A. (1905)[23] also calls into question the idea of there being *material* length contraction due to reference frame, rather than difference in perception alone.

The Barn pole paradox is similar providing two different reference frames. One from atop or next to the doors of a stationary barn and one riding or moving with a rod at a significant fraction of the speed of ‘light’.

The paradox concerns the idea of whether the pole can fit fully into the barn or not. At rest the pole is too long to fit entirely inside. The different observers have different opinions on what happens simultaneously as well as seeing different lengths for the pole. The person with the pole sees it too long and the barn contracted. The person at the barn sees the pole shortened and not the barn. This is very well illustrated by Mark L. Irons, (2004).[31]

Argument: In material Object reality neither pole nor barn are shortened. Differences in observed length are due to differences in the potential sensory input that is received and amalgamated together by the two different observers into their own product. Not material length contraction.

Although Mark Irons illustrations are explaining special relativity, they can also be thought of as an indication of how different sensory input obtained by the different observers is used generate their own Image reality products.

Twin(s) paradox: Some ideas

The paradox concerns one twin who stays on the Earth while the other flies off in a spacecraft travelling close to ‘light’ speed before turning around and flying back to the Earth. According to Einstein’s Relativity (Special and General for a full consideration of the problem) the space faring twin will have aged less.

The twins are in two different non-inertial frames of reference giving a highly asymmetric comparison. If this was a real-life scenario, the Earth bound will have the Earths motion; rotation and translation of that rotation in orbit around the sun, during the other's long journey. The space traveller must accelerate out of orbit, cruise, decelerate, turn, accelerate, cruise, and then decelerate for landing. The space traveller is aware because of the acceleration that he is in motion. He feels the g forces as his motion changes,
accelerating and decelerating. Because of the asymmetry there will not be reciprocal differences in observations (via signal transmissions) by the two observers during the complete journey.

Argument/ discussion:
This can be thought about in relation to Image realities, formed from EMr information receipt. Image reality, what is seen, does not (itself) affect Object reality.
(In other scenarios there can be changes to Object reality that are due to the behaviour of observers in response to the Image realities seen.)

In relation to Object reality: In a uni-temporal Object universe there is only one universal passage of foundational time, unaffected by motion. Foundational time should not be confused with clock time. Where the twins are located and how they move cannot speed up or slow that Foundational passage of time.

Motion of the observers cannot affect the relation between the material planets, the foundational Object reality of their separation and hence the travel time between them in Object reality. It can be understood that time dilation and length contraction do not pertain to Object reality.
The twins motion does affect what they observe (via signal transmission and receipt). The Image realities they produce are non-reciprocal because of the very different motions of the twins.

Incidentally, micro-gravity and radiation exposure hazards in space are detrimental to the human body and will cause material changes akin to aging. So the traveller will become biologically older than his twin.

Although 'the light clock' argument is used to (supposedly) show that time slows for an object in motion, the Light clock argument is flawed as has been shown.
Like should always be compared with like for a fair comparison. The metabolism and aging of a human being is not the same as the frequency matching of an atomic clock.

Source: An understanding of 'the paradoxes' openly developed on FQXi.org discussion pages by G. Woodward
Woodward, G.,P., 'Paradox and Category Error' viXra:1701.0509
http://vixra.org/abs/1701.0509(15. 1.2017)[32]

A current carrying wire and a free charged particle Lorentz Force paradox

Considering a charged particle in close proximity to a current carrying wire.

Argument based on Special relativity

Quote "Frames differ just when they define different *spaces* sets of *rest* points) or times (sets of simultaneous events). So the ideas of a space, a time, of rest and simultaneity, go inextricably together with that of frame." Nerlich G., (1994).[26]
Two different observation 'frames are used.

A) Charged particle considered as moving at the speed and direction of the electrons in the wire. (Could be called 'lab bench point of view')

B) Charged particle considered as at rest while at the speed of and direction of the electrons in the wire are also considered at rest. ('Charged particles point of view')

Special relativity is about relative perspective. This is '*how* it is' for the particle, even though the particle really has no opinion or viewpoint.

The wire is electrically neutral due to having equal numbers of negative electrons and positive copper ions, when no current flows. Also when frame A) is considered. In this frame of reference, the electrons are considered to be moving in one direction while the positive (lack of an electron) 'holes' can be considered to be moving in the opposite direction. Length contraction applied to both electrons and ions gives a wire still electrically neutral. No electric force applies to an outside charge.

A free electron outside the wire, or other negatively charged particle, moving with the electrons in the wire, is attracted. Likewise a free proton or other positively charged particle is repelled. As there is no net electric charge of the wire applying, the force has to be due to the magnetic field around the wire caused by the moving electrons interacting with the field of the free particle.

Frame B) The electrons in the wire are considered to be at rest. This is problematic since the charge of the electrons must be moving for the electrons in the wire to cause a magnetic field to occur. This issue is circumvented by positing that: Length contraction applying to the positive ions causing higher charge density and no length contraction of the now considered at rest electrons, lower their charge density. This gives a net positive charge. Which acts on the free particle. Attracting a negative charge and repelling a positive charge.

The conclusion of this kind of analysis is that electric and magnetic forces are different 'appearances' of the same occurrence.

Objections to the use of Special relativity to explain what happens

This idea of different' frames' works quite well when (unknowingly) considering what different observers see in their own self generated Virtual space times. The frames A, and B, considered here are not observations. As the bench and particle are not observers (do not generate observation products). The only information received by an outside charged particle 'observer' related to what is occurring inside the wire, is the force applied by the interaction of wire and free particle fields. No light travels from the internal particles to the 'observer'

The explanation using Special relativity involves length contraction of moving particles in the wire, affecting charge density. They are considered to be moving. [not in this scenario seen to be moving] Length contraction is taken as a given for objects moving at a significant fraction of the speed of light. However, the electrons considered moving, or the ions moving, when the electrons are considered at rest, in the wire, move slowly (drift speed) compared to the speed of light. Various sources state (in words to the effect) that length contraction becomes important at 1/10 the speed of light. Approx. 30,000 km/s. The movement of the particles in the wire is not fast enough for the effect of length contraction to be a significant factor. "The individual electron velocity in a metal wire is typically millions of kilometers per hour. In contrast, the drift velocity is typically only a few meters per hour while the signal velocity is a hundred million to a trillion kilometers per hour." (Baird, C., S., (2014)[27]

In reference frame B) the electrons are considered stationary. So individual speed between collisions or drift velocity collectively is irrelevant. However, movement of the ions relative to the electrons has to be drift velocity as they are fixed in the wire, and moving counter to the electrons collectively. The electrons collectively are passed by the fixed in the wire ions at drift velocity.

The different reference frames A) and B) are concerned with the movement of electrons, and movement of ions when the electrons are considered at rest. Not the near instant effect of available electricity when there is a complete circuit.

That material objects undergo length contraction, at constant velocity, is disputable due to the categorization error in ‘ON THE ELECTRODYNAMICS OF MOVING BODIES’ by A. Einstein June 30, 1905 [See in Einstein’s paper, under 2. On the relativity of lengths and times, the two operations (a) and (b)] Ref.[23]
Measurement of a material rod is carried out and compared with measurement of a seen manifestation. The light clock thought experiment has also been questioned.

Alternative explanatory framework

There is one material reality.
There is no Image-reality corresponding to the charged particle or the rest frame electron’s point of view. It is not an observer/ reality interface..
In Object reality there is just one complete happening of the event. Reference frames A) and B) are partial considerations only,
Moving electrons in wire causes there to be a magnetic field circularly surrounding the wire. A light bulb inserted into the circuit can show that current is flowing in the material circuit. Indicating electrons moving in the circuit despite the rest frame perspective, if illuminated.

In objective Object reality, there are all existing relations, without any imposed individual frame of reference. No matter whether the electrons in the wire are considered as moving or at rest, there is motion changing the relative positions of the electron collective and the wire ions, in both cases. Confirmed by the illuminated light bulb. Considerations A) and B) are considerations of the one material sequence of configurations (a part of Object reality). Therefore the same physics is happening.

Abstract thought experiments

1. If an ammeter could be employed by one of the moving electrons, keeping pace with its changing location, no flow would be measured. The electrons need to pass through the ammeter - not keep pace with it for current to be measured. Cf. A lone accelerometer falling …no acceleration measured.

In both scenarios the measurement result is an indication resulting from how the instrument functions. Neither device can measure the magnitude of a flow when moving freely along with the flow. It would be a mistake to take the no current reading to mean there is no current in the wire.

2. Without a free particle moving with the wire's electron's, just to judge whether the wire is charged. An electroscope could be placed alongside the wire. In the reference frame with moving electrons, they will pass by the stationary electroscope. In the frame with the flowing electrons considered at rest, the electroscope passes by. A tiny camera could be made to travel along the wire to observe the electroscope. As the electrons of the wire are not capable of observing the electroscope. The camera could be pulled by attaching it to a distant motor. The electroscope must give the same charge/no charge indication for both reference frames. Or there would have to be an explanation of how a device can be seen to perform differently according to reference frame. Repulsion of gold leaves and no repulsion are different physics occurring in the same device.

Proposed mechanism of action, recognized as a force

There is relative motion occurring between the charged free particle and the wire containing the current in both cases. As there is materially relative motion of charged free particle and the wire, the free particle will have a magnetic field. The wire because of the relation of the ions of it's material to the electrons (relative motion) will also have a magnetic field. There is no need to contrive non neutral charge of the wire to account for the force that occurs.

Likewise it isn't necessary to contrive the action of centrifugal force on a still, person being rotated. The force happens because of what is occurring in material Object reality. (Seeking to travel in a straight line but being prevented. Such as by the wall of a rotated drum or centrally fixed tether.) Not influenced by the person's singular viewpoint (I'm not moving so there can't be a force.)

- The magnetic fields of 'free' particle and wire, will interact giving attraction or repulsion from the wire. Identified as the Lorentz force
- An electron or other negatively charged particle is attracted, gaining stability from being more closely incorporated into the wire's field.
- A proton or other positively charged particle is repelled. Its field is incompatible and can not be incorporated stably into the wire's magnetic field. The wire's field gets weaker moving away from the wire. The magnitude of the field disturbance due to incompatibility decreases as the positive charge moves away to a more stable location,
- Two parallel wires with same direction of flow of electrons are mutually attracted. Their magnetic fields are compatible and can gain more stability by closer association and combination of their fields. With opposite directions of flow in the wires the fields are incompatible and can't stably combine. There will be less field disturbance as the wires move apart.

Logic and truth values

There is a problem with applying the truth values [true or false] to relative perspectives. Different relations can produce contradictory statements that are both true from their own perspective but false from another perspective.

Examples

Analogy: A two-sided jig saw (sandwiched between glass and each side seen by a different observer);

There is a boat picture. A yes = true, B no = true.

There is a cat picture. A no = true, B yes = true.

There is a cat picture and a boat picture. {A, B} yes = true. |

The globe is spinning clockwise A yes = True, B no = true.

The globe is spinning both clockwise and anti-clock wise {A, B}yes = True. |

From either side of a horizontal waveform:

The wave is at the peak of its oscillation. A yes = true, B no (it's at its trough) = true.

The waveform is at both peak and trough {A, B} yes = true. |

The aggregation of the relative perspectives can give a truth outcome for what seems an illogical statement. This is because we are used to thinking about characteristics/ properties as belonging to the objects and manifestations of them, observed/ measured. Not the relations between the object and a reference (relative to this) viewpoint.

Problem: The individual viewpoint that gives a true truth value is not regarded as partial but true. However, despite seeming to be contradictory and raising suspicion of being counterfactual, that is what the aggregation of different perspectives is a more complete truth than the partial analysis. It only 'feels odd' because it is a different way of thinking about properties and variables.

The Object universe, by the above reasoning, requires another kind of logic– the logic of aggregate viewpoints. It can be seen with that logic that even opposite, seemingly contradictory, truth statements can be aggregated into a larger truth.

For full truth there needs to be not one impartial objective view but *all* relational (relative perspective) views; '*the whole elephant'*. Basing evaluation of truth on the 'reliable cognitive process,' Ichikawa, J. and Steup, M. (2017),[35] comes to difficulties when the cognitive process itself is selective with the truth. As previously argued on page 53. From this reasoning, the unknowable Object universe is the full truth as it is, all existent things and all relations between them, not partial, not subjective. It's history, that no longer exists but is an imaginable concept, is the sequence of former configurations, wherein lies the full truth of all things in their time. Unlike partial historical accounts and records that are derived from limited and subjective viewpoints.

Absolute (complete) Object reality, counterfactual definiteness, the law of non-contradiction and context

As 'our' (individual human) perception, informed via our senses directly or by accessing the output of our singular devices, is definite, showing particular, singular identifiable states, we may be fooled into thinking that therefore that is what macroscopic reality itself is like. That is problematic. Prior to observation, without an observer's reference frame applied and no specification of when or where a measurement is to be made, the object is in an absolute unmeasured state. That is being all that it is, not any partial aspect: The whole truth. For to be assigned a definite state, observer viewpoint relative to the object, and/ or measurement method is needed.
Examples of absolute states without contradiction include both clockwise and anticlockwise spin; a boundary wall that is simultaneously both concave and convex; a state of both heads and tails, simultaneously.

Any viewpoint of a source object gives a representation of a part of the form of the 3D source object, part of the surface (usually), not the whole of the source object. Seen manifestations of objects have limited fixed states determined by measurement/ observation. The state observed by any singular observer is limited. As the sensory

information, from which the seen reality is made is limited. The received signals are a limited sub set of all of the radiation within the environment issued from the object. All of which has the potential to enable generation of sensory information pertaining to the source object.

Measurements select only a limited number of detectable outcomes. A coin's state at measurement may only be seen as heads or tails. The measurement method provides only one of those two outcomes nothing else. Consider: A concave/ convex cup is, in absolute truth, in Object reality, in both states simultaneously. It is when observation is made, that a particular ‘viewpoint’ is imposed and, it 'becomes' one or the other. It, the observed manifestation, is not the same 'it' as the material source, or the pre-selection potential sensory input, pertaining to the source and distributed within the environment.

It, the observed manifestation, i*s truly just one state*, concave or convex, because the signal content to form the contradictory state cannot be received simultaneously by the same observer. It is not and so does not form a part of the observer’s emergent Image reality. The emergent reality does not contain the counter factually definite. That makes it partial truth formed from incomplete information. In contrast to the absolute truth contained within Object reality. This is a switch from thinking about the world in a way, that includes all possible outcomes, to looking at it in just one way upon realization of the measurement or observation outcome.

The counter factual possibilities are unseen within the potential sensory inputs distributed in environment and possibly still part of the Object source (if it has endured). Both both belonging to the Object reality. The law of non-contradiction states: Contradictory statements cannot both be true, in the same sense, at the same time. An unseen material object in Object reality, (and a theoretical superposition in a quantum probability space), are conditions in which it can be argued that the law of classical logic called the Law of non-contradiction does not apply. The aggregated ‘contradictory’

possible states prior to measurement are not generally described along with their own individual causal context which would allow the statements about the unmeasured to be taken as ‘different senses’.

There has traditionally been the idea of a divide between the sub atomic and macroscopic scales. This comes about as the result of the different ways in which humankind interacts with them. Primarily interacting with the macroscopic scale via sense of sight. With the limited, fixed, definite state products of that sensory processing. *There is another divide which is between Object reality and Image reality.* Objective, unmeasured/unseen Object reality exists at all scales including the astronomic and sub atomic. Object reality is what exists preceding all observed Present representations of it. That follows from understanding that, experienced Presents are generated from received EMr signals (that have been emitted from objects), which are then processed into sensory information and then perception and cognition. Those processes happen over foundational passage of time, (a sequence of change of the Object universe’s configuration). The duration of the signal transmission may be extremely small when objects are in close proximity. Nevertheless the speed of ‘light’ is finite, not infinite. Within the Object reality is the EMr that has the potential to cause formation of sensory information. That is processed to form Image realities of former existence.

The EMr is spread within uni-temporal space, not space-time. It is meaningless radiation until received and processed. The radiation and other ‘potential sensory inputs’ in the ‘Data pool’ are not the space-time continuum. A significant difference is its content can only be processed into Image reality products not substantial objects and events. It also does not include any potential inputs from material events that have not yet occurred in material reality. Creative fiction and fantasy transmitted in TV and radio signals, and from screens, are an exception. As the perceived reality generated by the observer, (what appears to have happened), differs significantly from the material events used to create the entertainment.

Only the physically co-existing can have a direct effect upon each other. Effects of objects upon each other that are separated have to be mediated by a physical field, existential physical fields or waves in a material wave medium. Uni-temporal Now is the only existing time, in which objects wholly exist. That does not mean that Objects cannot be affected by the former action of other objects, and calculations made. Such as a boat rocked -Now by the wake -now from the earlier passing of another boat.

On the accuracy of maps, related to physics modelling

As Relativity is generally understood, what is seen (in Einstein's words, 'sensorily given'), is taken to be the same as the external reality of objects in space-time. This has happened because of a categorization error. Measurements of seen images are muddled with measurements of material objects. The necessarily 'sense-able/ detectable information' derived space-time universe is taken to be THE reality, THE universe. The generated location of the seen visual product, (because of the way in which vision works using received EMr), and the material source of the seen 'image' are not in space-time together. Image reality V.space-time and uni-temporal Object reality space are different spaces. The train measured from a distance is not a material train. Nothing seen in V.space-time *is* a material object. (Analogies; the computer console is not inside the game being played: The book being read is not inside the story.) The categorization error, (category differentiation error), confusing Map and Territory is also the cause of the paradoxes associated with Relativity.

It isn't correct to assume the 'reality' produced from descriptions of what is being done mathematically, to be complete reality. That mistake would be a bit like taking the Harry Beck London underground maps to be complete reality, for accurately predicting the order of stations and line exchanges only occurring at marked junctions. The 'tube' maps are designed for ease of use of the network, although the spatial journey of a passenger on the material train does not correspond to the spatial changes shown on the

Harry Beck's 'Tube' map 5. The map represents some aspects of reality accurately; ordering of stations, and correctly indicated line junctions where passengers can switch lines.

The Harry Beck's maps are part of the collection of the London Transport Museum. The 1933 Harry Beck map, (pocket map) and the 1959 version are
© TfL from the London Transport Museum collection. Referenced 1999/321 and 1984/51/608

The spatial distribution of the network, that is its correspondence to spatial geography, has been forfeited. It is spatially/ geographically highly inaccurate in order to give simplicity of function, that is ease of use. It can be used for easy navigation of the network but not for planning a journey outside of it. Meaning the locations of the stations in relation to each other on the map do not correspond to the geographical distribution of the stations in material reality or on ordinance survey maps.

The layout of the London Underground 'tube' maps has no doubt caused some traveller's confusion about actual distances travelled between marked stations. Research on this is published in a paper called 'Mind the Map': "Results show that the elasticity of the map distance is twice that of the travel time, which suggests that passengers often trust the tube map more than their own travel experience on deciding the "best" travel path. This is true even for the most experienced passengers using the system" Zhan Guo, (2011).

The map is constructed from information about the network and conveys that information accurately. However it does not fully correspond to the reality that is the underlying reason for it. I.e. the material 'tube train' rail network with a particular spatial distribution in material reality. The relevance to physics is that this provides a refutation of the argument that a model with impressive predictive power must be accurately modelling reality because of that high predictive power. The map analogy shows that

high predictive power can only be taken as an indication of some correspondence to reality not entire correspondence.

It has been argued here, that it is possible for something to be highly accurate in some regards but also inaccurate in other regards, by example of he Harry Beck London Tube map.

Source: Woodward, G.,P., The Map is not the Territory, viXra:1708.0268, (22. 8. 2017) http://vixra.org/abs/1708.0268

Justified true belief (JTB) and justified misinformed belief (JMB)

Information received from an experiment is used to give a particular perception of the source reality. Does it fully match the external reality? No because it is a limited viewpoint.

Though there is no clear consensus it seems ‘knowledge' might be explained as 'justified true belief' (JTB), with some extra condition or conditions, or instead K-reliabalism's explanation based on reliable cognitive process, or a causal connection between belief and the fact. (Ichikawa, J., J., and Steup, M., (2017)[35]

A lot of the debate on what it (knowledge) is and isn't could be eliminated by agreeing on an extra term; 'misinformed knowledge'; Referring to what seems to be knowledge of an external truth but is not what it seems to be.

‘Misinformed knowledge’, a subject is known and understood but is itself erroneous, or misleading due to incompleteness. This allows recognizing the condition of being knowledgeable rather than ignorant or uninformed about. such a subject,

A belief can be justified without the subject of that belief being the truth or the whole truth. A court requires witnesses to give evidence that is the truth, i.e. not false, and the whole truth, not omitting relevant facts. The more complete the true evidence the better

the representation of events.

The Justified Misinformed Belief (JMB) terminology is helpful in avoiding arguments about what is and isn't knowledge when the thinker is misinformed but has a justified belief. Evidence available to the belief holder may justify the belief, in the absence of further evidence refuting the validity of the belief.

It is also possible to see that JTB can change to JMB when additional information is available. i.e. what was true for the known data set is not true for the expanded data set. (Or if there is more complete understanding of the evidence.) Example: All swans are white -until the first black swan is found. The opposite process may also occur; supposed (according to available data and expert opinion) JMB can change to JTB when more evidence is available later. (Or if there is more complete understanding of the evidence.) Example: High fat diets are unhealthy for humans, becomes -a high fat diet can be healthy for a human.

That recognition of how the categories are not necessarily permanently fixed but change with the information that is available is useful for science. With that extra JMB term, what was knowledge is not becoming not knowledge or non-knowledge, but misinformed knowledge when superseded. That is relevant to investigation of foundational Object reality.

Argument: One can have a justified true belief that a magician is concealing information. One can have that knowledge in that 'JTB' sense but not in the reliable cognitive process sense. Since the information receipt is necessary for the cognitive process providing the knowledge. For full truth there needs to be not one view but all possible relational views.

Basing evaluation of truth on the reliable cognitive process comes into difficulties when the cognitive process itself is selective with the truth, i.e. only limited signals and results are obtained, that can be further reduced in their processing. It also combines

evidence together that did not co-exist in the Source reality and the 'evidence' can be 'tampered with', subject to distortions, interference and absorption.

Certainly, human beings can have power over the perception of reality of others by control of information. It is the art of magicians and craft of propagandists. Bending of ‘light’ around an object can cloak it. Animals that use mimicry rely on providing information that will mislead a predator. Animals that use camouflage decrease their chances of being detected by predators or prey.

The notion of linear cause and effect at a singular scale limits our perception of how events unfold. In a linear causal sequence, only ‘significant’ known knowns are included, and a great deal is left out. There are multiple influences and scales of influence acting (already brought about) producing a particular outcome. This may be a chink in determinism's armour.

Falsification of the uni-temporal explanatory framework

As there is no possibility of backward time travel, even for particles; as there is no foundational time that is separate from the existing configuration of the uni-temporal Object universe. If time travel, (outside of Uni-temporal Now), of material objects is shown to happen, with or without a space-time Worm hole, it will disprove the hypothesis of uni-temporalism and the Object universe.

Concluding Remarks.

‘Proposition and argument for a new understanding of time, material existence and experienced or experience-able reality and evidence in support has been given. Providing resolution to all of the problematic issues set out here.

It has been shown that many longstanding issues and paradoxes of physics are due to not having a correctly differentiated explanatory framework.

That takes account of both existential Object reality and input derived Image reality observation products. Revealing itself as numerous categorization errors. Identified in 'On the electrodynamics of moving bodies' (Einstein, A. 1905)[23] and his light clock thought experiment. Important for understanding the reasons for the paradoxes of Relativity and other unresolved issues as discussed. In other cases not differentiating Object reality and Image reality is responsible for lack of an adequate explanation; arrows of time, Mach's principle, Andromeda paradox. Clear identification of what is involved in Object and Image reality allows definitive resolution of the question, Is the moon there when I'm not looking? (Pais, A., 1979)[24]

Useful categorization of the terms, light vs "light" or EMr, colour vs frequency has been given. As well as definition of important terms and new terminology.

Truth values are seen to be only partial and the law of non contradiction does not hold when unobservant objective Object reality is considered.

It has been argued that 'misinformed knowledge' be added to the vocabulary used to discuss the meaning of knowledge. Justified Misinformed Belief (JMB), another helpful distinction has been suggested. Enabling clear recognition of the condition of holding a belief, justified by evidence, that is erroneous, or misleading due to incompleteness. It has also been argued that JMB and JTB status can change as more evidence, or understanding of the evidence becomes available.

Definitions

Actualization/ element of Object reality
That which is or has become actual or real, independently of information receipt and processing by an organism, device or apparatus. Pertaining to existing components of the source Object universe.
Existing actualizations fit the philosophy *of* Endurantism.

Beable
Something that primarily is, rather than an observable 'property'. It may be an Object, field or a characteristic of the material configuration, such as the setting on a dial. Allows distinction between physical and non physical quantities. For example a field is a physical beable. Whereas the associated potentials are not. (Bell J.S. 1975)[3]

Category mistake
"The error of assigning to something a quality or action which can only properly be assigned to things of another category, for example treating abstract concepts as though they had a physical location." (lexico.com, Dec. 2021)
"... a property is ascribed to a thing that could not possibly have that property. An example is the metaphor "time crawled", which if taken literally is not just false but a category mistake." (Wikipedia July 2015)

Categorization error:
Failure to correctly differentiate Object reality and Image reality categories, or omission of a relevant category from consideration.
Category differentiation error:
Failure to correctly assign different categories to the actualization, noumenon or beable and the associated manifestation or phenomenon, whereby it is known.
(Subset) Category omission error:
Complete omission of consideration of a relevant category.

Causality front:
Where material change happens. It can be thought of as the boundary between the non-existent, Unwritten future and the existing configuration of Uni-temporal-Now

Data pool
All potential sensory inputs/ stimuli in the environment

Image reality
Pertaining to observation products and their manifestation

Light:
The seen light product of processing of received EMr
"Light"/ Emr
The unseen electromagnetic energy and potential stimulus in the environment

Manifestation/ Observation product/ element of Image reality:
The seen or see-able product from the electromagnetic radiation (EMr), or other potential sensory signal, (the stimulus) input, and subsequently generated sensory information processing; by an organism or device.
A manifestation can be the conscious experience of a higher organism.

Noumenon
"A posited object or event that exists independently of human sense and/or perception.[bold emphasis added]. The term noumenon is generally used in contrast with, or in relation to, the term phenomenon, which refers to any object of the senses." Wikipedia Noumenon (2021)[2]

Object reality
Pertaining to; existence independent of observation, material actualizations and their changing configuration

Object universe:
The uni-temporal material universe [by definition]. Which continues to exist because it endures from configuration to configuration [change specified by premise 2.], and [it follows from premise 1.] has no parts spread over time. This fits the philosophy of Endurantism,

Observer:

An observer is an organism, observation device or apparatus that receives EMr or other 'sensory' input. and generates an observation product by a process or multiple processes resulting from the input; according to type of reality interface.

The Past

There is no enduring material Past but there are imperfect and incomplete records, including memory (which is plastic and not fixed). Remaining relics, neural structure storing memory and material records, that all exist, are wholly within Uni-temporal Now.

The Present

Present/ present-now/ here and now/ ‘now’; All the preceding terms are terms for the observed manifestation formed by an observer from received signals, that enabled generation of sensory information (electrical impulses or their inhibition). Which, through internal processing, produced experience and cognition of a semblance of external (to the observer) reality.

The Pre-written (potential) future

The not yet received potential sensory stimuli that already exist in the environment

Reality Interface

In this explanatory framework a reality interface is organism's sensory system, device, system or apparatus that converts received EMr input or other ‘potential sensory stimuli’ that is unobserved, to different observed/ experienced, or observable/ experience-able product. *An interface between the underlying source reality and perception, of it;* imposing orientation and relative reference frame. It gives a limited fixed state product, that pertains to the information input from the environment.

‘A time’

corresponds to a sequence of configurations of the Object universe (or -Nows). (That being so, an appropriate [size] scale and [time] span for the meaning of ‘a time’ should be employed to suit the kind of material circumstance considered.)

The sequential change in the material configuration of all existence, (the Object universe), is [by definition] Foundational passage of time.

Foundational time

The passage of time independent of observation; It is a temporal expression for the sequence of actualized, existing, uni temporal, material configurations of Object reality (pertaining to the configuration of the Object universe)

Emergent time

Emergent time: this is the time that is experienced or measured by an observer (organism, device or apparatus), via signal receipt.

Proper time

The time shown on an observer’s own clock considered at rest with the observer. When used with space-time, Proper time is measured along the ‘time-like world line’ taken. “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”, Holster, A., (2016).[12]

Newtonian time

“Absolute, true and mathematical time, of itself, and from its own nature flows equably without regard to anything external", Newton, I. (1687)

i Uni-temporal Now (-Now):

a) the temporal expression of the actualized, youngest configuration of all material existence. The corresponding material actualization and relations of parts within shall be referred to as the Object universe.

b) a unique pattern of the entire Object universe.

c) Signifying one foundational time; That is the same throughout the entire extant/ existing material (Object) universe.

d) It is the material (ideal) 'moment' between what has materially existed and what does not yet exist. (Uni-temporal Now is *not* between observed Past and a material, yet to be observed, Future.)

The Unwritten Future

The other future (pertaining to material and beable reality) that is n*on-existent*: The imagined nothingness prior to actualization.

Universe terms

• Object universe: uni-temporal pattern and substance of all existence, at all scales. All extant actualization. Uni-temporal Now: temporal expression of the Object universe, extant pattern and substance. The Data pool is a sub set of the content of the Object universe.

• Image universe: astronomic observatory outputs from processing of received signals Visible, Observable and Image universe relate to our relation to EMr signals, whether through sense of sight or utilizing telescope technology Including the rendering by technology and artists.

• Material universe: those parts of the Object universe that are fermion particle differentiated existence, or matter constituted of fermion particles. Where occurrences happen, that involve matter as particles, materials, objects, structures, systems, material media and physical fields. The Material universe can be considered a subset of the content of the Object universe.

• Visible universe: visible to human's part of EMr spectrum that is arriving at and receivable on Earth or location of space based receivers. From which images can be generated.

• Observable universe: Primarily EMr of those parts of the EMr spectrum arriving at and detectable by human device's that can be received (arriving) on Earth or their space

based devices' locations. Including wavelengths outside of the visible (to human's)part of the EMr spectrum. From which see-able images can be generated.

The 2 preceding definitions can be expanded to include EMr that is receivable and recoverable by humankind at locations outside of our solar system, when we have receiving devices there. And the observable universe could be extended to include other kinds of signal arriving and detectable, such as from gravitational waves.

References

1. Hawley, K., "Temporal Parts", *The Stanford Encyclopedia of Philosophy* (Summer 2020 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2020/entries/temporal-parts/>.

2. Wikipedia Noumenon https://en.wikipedia.org/wiki/Noumenon Retrieved 2nd Dec 2021

3. Bell. J. S. (1975) The Theory of Local Beables Presented at the sixth GIFT seminar Jacs, 2-7 June 1975 .Via https://cds.cern.ch/record/980036/files/197508125.pdf Retrieved Dec.2021

4. Graham, D. W. (2015) "Heraclitus", *The Stanford Encyclopedia of Philosophy* (Fall 2015 Edition), Edward N. Zalta (ed.), Retrieved from https://plato.stanford.edu/archives/fall2015/entries/heraclitus/

5. Cleanthes from Arius Didymus from Eusebius. (1st Century BC) cited by Graham, D. W (2015) "Heraclitus", *The Stanford Encyclopedia of Philosophy* (Fall 2015 Edition), Edward N. Zalta (ed.), Retrieved from https://plato.stanford.edu/archives/fall2015/entries/heraclitus/

6. Eagleman, D. (2011) on CHOICE (video) Retrieved from https://www.youtube.com/watch?v=MkANniH8XZE FQXi.org/conferences/talks/2011

7. Clynch, J. R. 2003. Precise Time and Time Interval Clocks, Time Frames and Frequency. Department of Oceanography Naval Postgraduate School URL= www.oc.nps.edu/oc2902w/gps/pttinote.pdf Retrieved Sept. 2017

8. McDaniel, K., "John M. E. McTaggart"(2016), *The Stanford Encyclopedia of Philosophy* (Winter 2016 Edition), Edward N. Zalta (ed.) Retrieved from https://plato.stanford.edu/entries/mctaggart/

9. Markosian, N. (2016) "Time", *The Stanford Encyclopedia of Philosophy* (Fall 2016 Edition), Edward N. Zalta (ed.). Retrieved from https://plato.stanford.edu/archives/fall2016/entries/time/

10. Rynasiewicz. R. (2014). "Newton's Views on Space, Time, and Motion", *The Stanford Encyclopedia of Philosophy* (Summer 2014 Edition), Edward N. Zalta (ed.). Retrieved from https://plato.stanford.edu/archives/sum2014/entries/newton-stm/

11. Motte, A. (translator). (1966). Sir Isaac Newton's 'Mathematical Principles of Natural Philosophy' and his 'System of the World.' Los Angeles. U.S.A. University of California Press.

12. Holster A. Proper Time, Coordinate Systems, Lorentz Transformations Retrieved via https://www.iep.utm.edu/proper-t/ Last retrieved Sept 2018

13. Reiss, J., Sprenger, J., "Scientific Objectivity", The Stanford Encyclopedia of Philosophy (Winter 2017 Edition), Edward N. Zalta (ed.)

14. Professor of Robotic Vision at QUT (Queensland University of Technology). Corke, P. QUT Robot Academy (educational resource), https://robotacademy.net.au/ Feb 2020

15. Wikipedia, Jurassic Park film, https://en.wikipedia.org/wiki/Jurassic_Park_(film) 15/04/2020

16. Kok and De Lange, Faculty of social sciences. Radboud University. (2014). Brain fills gaps to produce a likely picture. Retrieved from http://www.ru.nl/sociology/@943986/pagina/ 0n 3/12/16(Faculty of social sciences.

17. Bartels, A. (2014). Visual Perception: Early Visual Cortex Fills in the Gaps. Current biology (24, 13), pR600–R602. DOI: http://dx.doi.org/10.1016/j.cub.2014.

18. Meaning of Category Mistake in English, https://www.lexico.com/definition/category_mistake, last access Dec. 2021

19. Category mistake, Wikipedia, July 18th 2015 https://en.wikipedia.org/wiki/Category_mistake

20. Hawking, S.,W., & Ellis, G., F., R., (1973). The Large Scale Structure of Space–Time. Cambridge University Press. p. 1. ISBN 978-0-521-09906-6.

21. Weinberg, S., (1972). Gravitation and Cosmology. USA: Wiley. pp. 7. ISBN 978-0-471-2567-5

21a. Nick, H., Hoefer, C., Read, J., "Absolute and Relational Space and Motion: Post-Newtonian Theories", The Stanford Encyclopedia of Philosophy (Fall 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/fall2021/entries/spacetime-theories/>.

22. Quote: Feynman, R. (1979). Douglas Robb Memorial lectures 1979, recorded at The University of Auckland (New Zealand), University of Auckland (NZ). Retrieved from http://www.vega.org.uk/video/subseries/8

23. Einstein, A. (1905). On the electrodynamics of moving bodies. Via

https://www.fourmilab.ch/etexts/einstein/specrel/www/ [See under 2. On the relativity of lengths and times, the two operations (a) and (b)]

24. Pais, A. (1979). Einstein and the quantum theory. Rev. Mod. Phys. 51, 863–914 (1979), p. 907

25. Wavelength Definition and Meaning, Dictionary.com(2021)

26. Nerlich G., 1994,, Cambridge University Press. p.64 *What Spacetime Explains: Metaphysical essays on space and time*.

27. Baird, C., S., (2014). What is the speed of electricity. via wtamu.edu/~cbaird/sq/mobile/2014/02/19/what-is-the-speed-of-electricity/ [Published: February 19, 2014]

28. E= Einstein, His Life, His thoughts and His influence on our Culture, Sterling publishing Inc., New York, London 2006: Quote from Part one p.34

29.‘Physicists Tame Time Travel by Forbidding You to kill Your Grandfather’, Wired, 20 July 2010

30. Penrose, R. (1989). The Emperor's New Mind: Concerning Computers, Minds, and the Laws of Physics. Oxford. Oxford University Press. p. 392–393.

31. Irons, M. L. (2004), last updated10 August 2007. The Pole and Barn Paradox. http://www.rdrop.com/~half/Creations/Puzzles/pole.and.barn/index.html (Last) retrieved 26th Sept 2018

32. Woodward, G.,P., ‘Paradox and Category Error’viXra:1701.0509 http://vixra.org/abs/1701.0509(15. 1.2017)

33. Harry Beck's Tube map. Transport for London. https://tfl.gov.uk/corporate/about-tfl/cultureandheritage/art-anddesign/harry-becks-tube-map

34. Guo, Z. (2011). Mind the map! The impact of transit maps on path choice in public transit. Transportation Research Part A: Policy and Practice. Vol. 45, (7), pp.625-639

35. Ichikawa, J., J., and Steup, M., "The Analysis of Knowledge", The Stanford Encyclopedia of Philosophy (Fall 2017 Edition), Edward N. Zalta (ed.)

Other sources, Inspiration, background reading

- YotaSpace YouTube video YESLecturesYota https://www.youtube.com/watch?v=Wj1rPy4bCpk 3 Dec 2010
- Tegmark, M., (25 Sep. 2007) 'Shut up and calculate', arXiv:0709.4024v1 [physics.pop-ph]
- Smith, J.C.N. (2012). Rethinking a Key Assumption About the Nature of Time. Retrieved from http://fqxi.org/community/forum/category/31418
- Kalidasa. (5th Century) Salutation to the Dawn. Sanskrit poem.
- Callender C. (2006)."Time in Physics." Encyclopedia of Philosophy. Via http://www.encyclopedia.com/humanities/encyclopedias-almanacs-transcripts-and-maps/time-physics 12. 12 16
- **7** Broad, C.D. (1923) In Scientific thought. London, New York. Kegan Paul, Trench, Trubner & Co.Ltd.
- Overduin, J. 2007. 'Einstein's Spacetime'. Via https://einstein.stanford.edu/SPACETIME/spacetime2.htm
- Woodward, G. (2017). Examining the Light Clock Argument, Clocks on Planes, Wavelength and Doppler Shift, in Relation to Object and Image Reality. viXra:1703.0030 [pdf]
- Woodward, G.,P., The Map is not the Territory, viXra:1708.0268, (22. 8. 2017) http://vixra.org/abs/1708.0268
- The 1933 Harry Beck map, (pocket map) and the 1959 version are © TfL from the London Transport Museum collection. Referenced 1999/321 and 1984/51/608

- An understanding of time openly developed on FQXi.org discussion pages by G.Woodward.
- Woodward, G., P., ‘Uni-Temporalism, the Relation of Human Beings to Time and the ‘future’ of Time in Physics’, viXra:1612.0389, http://vixra.org/abs/1612.0389 Via **https://einstein.stanford.edu/SPACETIME/spacetime2.htm**
- An understanding of ‘the paradoxes’ openly developed on FQXi.org discussion pages by G. Woodward
- Guthrie, W. K. C. (1965). *A History of Greek Philosophy*, ii: *The Presocratic Tradition from Parmenides to Democritus*,(51-52) Cambridge: Cambridge University Press cited in Palmer, J., "Parmenides", *The Stanford Encyclopedia of Philosophy* (Fall 2016 Edition), Edward N. Zalta (ed.), Retrieved from https://plato.stanford.edu/archives/fall2016/entries/parmenides/
- Palmer, J. (2016) "Parmenides", *The Stanford Encyclopedia of Philosophy* (Fall 2016 Edition), Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/fall2016/entries/parmenides/
- Minkowski, H. (1909). *Space and Time*, Tr. Ganesh Prasad in: Bulletin of the Calcutta cited in Markosian, N., "Time"(2016), *The Stanford Encyclopedia of Philosophy* (Fall 2016 Edition), Edward N. Zalta (ed.), Retrieved from https://plato.stanford.edu/archives/fall2016/entries/time/
- Odenwald, S. (2016). Special and General Relativity Questions and Answers. Retrieved from https://einstein.stanford.edu/content/relativity/q411.html 7.12.16
- Newton, I., (1687). (author), Cohen, I.B., Whitman, A., & Budenz, J. (Translators). (2016). Isaac Newton, The Principia, The Principia: The Authoritative Translation and Guide. California, U.S.A. University of California press