Paradox and Category error Georgina Woodward 2017

Differences between objects and images

When speaking, or writing English it is not usual to use different nouns or different noun-pronoun combinations for images and objects that are of the same superficial appearance. E.g. A cat on a screen is referred to as 'a cat'. That lack of differentiation is *not good enough* for physics. Despite superficial similarity of appearance, they are *not* equivalent. There are some important differences between an image and source object.

With a simple convex lens, a source object (for this demonstration a living cat), light source and screen, (set up to produce an image on the screen), it possible to demonstrate that an image produced from light reflected /emitted from the surface of the source is qualitatively different from the source object. This image has some characteristics that apply to its method of production, it is a real image displayed on a screen, but it is also possible to say some things that common to all images, in bold type.

1. The source of an image, a substantial object having corporeal or material nature, exists whether the image is produced or not. The cat object has an existence that is independent of the process necessary to produce the image of the cat on the screen.

Take away the lens and the image ceases to be visible but the object is still visible.

2. Images are emergent reality formed from the receipt and processing of EM potential sensory data". Emergent, in this context, means coming into existence *as the result of a physical process or interaction,* involving electromagnetic radiation, that enables image production.

The cat object has the characteristics of a living thing. For example, it is respiring and is sensitive to stimuli. Test the composition of the air in proximity to the image and increased Co2 consistent with exhalation will not be detected. Poke the image with a pencil and it will not respond in the manner of the cat object experiencing similar stimulation attempt. **3. Images are not alive.**

The image seen on the screen is 2 dimensional. The cat object is 3 dimensional. It has volume and hence an interior and exterior. It can be viewed all around and is source of all possible images of it, not merely the image of one surface aspect of its topology (shape). **4. Object and image are NOT such that each spatial point of the object corresponds to a spatial point on the image. The image has no exterior and interior, unlike the source object.**

5. A real or virtual image, seen at a time, by a singular observer, is a limited fixed state emergent reality. An image of one surface aspect of the source object's topology; pertaining to its configuration and properties *when emission of the EM information from its surface occurred*. The speed of light is so fast, at every day speeds and distances the image seen closely resembles an aspect of the topology of the absolute, actualized object.

Whereas the object is an absolute actualized foundational reality. Absolute because it is simultaneously the source of all possible images of it. I.e. with no viewpoint or reference frame applied, **all** prospective viewpoints of it that might be imposed are equally valid. Actualized meaning a substantial element of Object reality (i.e. having corporeal or material nature), existing independently of observation.

Images can be real images, that is they have an existence in external Object reality (outside of the observer), or they can be virtual. Virtual images only have the appearance of external reality. The reflection in a mirror or produced by a concave lens are of this type. The light received by the eyes and interpreted by the brain causes the generation of an internal Image reality, of an apparently but not actually external image, to be seen. The real image too is seen by production of a further internal Image reality of it. In this case the light from the external image on the *material screen* acting as external source of the Image reality that is generated.

Vision can be thought about by likening it to the way in which the different types of image are seen. Manifestations, (Image realities), do not have external existence but most usually do relate to a source of the information from which they are generated. The source is usually a material object. Images can also be generated by the brain from internal information producing an alternative "reality", independent of an external

source of information, i.e. a hallucination, which is superimposed upon the Image reality generated from sensory information of external origin. That it is a hallucination can be verified by others who will confirm that there is no external source for the manifestation observed.

Some further differences between images and objects

Factors that affect the potential sensory data from which images will be formed affect the form or appearance of the output image. Constructive and destructive interference of the EM waves from which an image could be produced, affect the appearance of the image, or whether it is seen or not. Filters may affect the colour of the image. Convection currents in air can produce a shimmering image.

The action of a substantial body is such that it minimizes potential energy. The action of an image is dependent upon the EM radiation, (and effects upon its distribution), from which images are formed. The distortion of images due to the environmental effect on the distribution of EM radiation includes so called gravitational lensing, caused by altering the path of the light due to the environmental conditions in proximity to the massive body. When this occurs, the form of the galaxy image is not the same as the form of the substantial galaxy that was the source of the EM radiation but remarkably dissimilar.

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

Also, the relevance of projective geometry, allowing representation of perspective can be considered. Observer perspective, not just relative motion, is also an important part of Image reality formation. Observer position affects the size of the image seen there and then, not just its temporal origin I.e. when the potential sensory data from which it is formed was emitted.

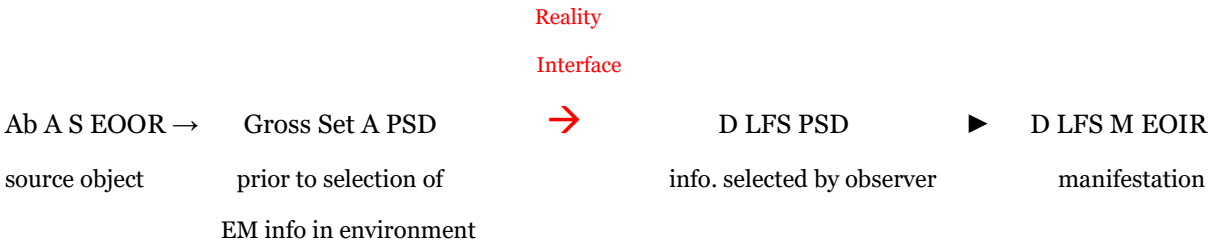
To understand the cause of the paradoxes of relativity theory it is necessary to recognize that it is emergent *images* (that shall be called manifestations) that are being seen and not material, substantially real objects.

The source object is material, substantially real. It is also absolute, as no reference frame applied, so all prospective viewpoints of it are equally valid, it is the potential source of complete information. It is an actualized (actual or real independently of observation) element (part) of Object reality.

An absolute, actualized element of Object reality (absolute as no observer viewpoint or frame of reference has been applied) is not equivalent to a definite (as viewpoint or reference frame has been applied), limited fixed state (as there has been selection of information giving a partial view of apparent topology) manifestation (an output of sensory data processing, an element of Image reality.)

To confuse elements of Object and Image reality as the same thing is a category error.

The Gross Set of potential sensory data in the environment is not a complete set of all *possible* potential sensory data emitted by the source object but a subset of that. A Gross Set in this context means; all potential data within the environment pertaining to the source object prior to observer selection. Not complete / absolute data because the environmental context of the source object may have prevented EM emission from the entirety of its surface. Some parts may not be exposed, some parts not illuminated. Also some potential sensory data may (or will) have been absorbed by other objects or by interaction with other particles. The amount and distribution of the potential sensory data is thus affected by the environmental context in which the absolute object is situated and the environment in which the potential sensory data is distributed. The manifestation has a singular limited fixed state, produced from the sub set of sensory data received rather than many possibilities of the absolute object and the Gross Set of pre-selection sensory data.



Category mistake or category error

"A category mistake arises when things or facts of one kind are presented as if they belong to another." (Blackburn, S. 1994.) **1**

It will be shown that it is theoretically possible to work back from the sensory perception outputs to the sensory inputs and their origins. If a description requires acceptance of paradox, unreality of all things, quasi reality or supernatural agents or realms, yet is a description that fits with observation, it must be incomplete if not incorrect or non-science.

Given there is no conflict with, or prohibition by physical events, a sentence can be written that has correct spelling and grammar, is complete and is untrue. The correctness and completeness of the sentence does not make it conform to the external reality outside of the correctly formulated statement. Likewise, mathematical completeness and mathematical correctness, and correspondence with experiment should not be mistaken for complete veracity of the idea the mathematics is taken to represent. It does not mean that the meaning or theory attached to it properly describes reality.

A blindfolded individual is asked by a researcher to say what is in front of them, based on some clues that relate to a dog of a certain breed. That person reaches the conclusion that there is a living dog there. Whereas in fact there is a picture of a dog. The description fits, because it fits both a living animal dog and a good illustration of the same breed of dog: The same dog type but belonging to different categories of object. *Correspondence between the description and the unknown reality does not show that it is as presumed. All that is shown is that the hypothesis is not disproven by the test of correspondence with the description.*

Like should be compared with like. In an any experiment, whether actual or thought experiment. The method used for each test should be equivalent in order to be fair. That is not so in Einstein's description of measuring rods and clocks in 'On the electrodynamics of moving bodies" (Einstein, A. 1905.) **2**. The results are that different things belonging to different categories of reality are measured. Differentiating Image reality from Object reality is important because it gives the source of the paradoxes that are inherent in the work and it identifies the error permeating relativity theory and consequently other areas of physics.

About measurements

Here 4 kinds of measurement that are used in 'On the electrodynamics of moving bodies' A. Einstein June 30, 1905. **2**, will be differentiated.

1. The measurement protocol prior to viewing the result involves direct interaction with a substantial object or particle that is the subject of measurement. This will be called 'object measurement'.

2.The measurement protocol prior to viewing the result does not involve interaction with a substantial object that is the subject of measurement but does involve an image (manifestation). This will be called 'image measurement'.

3.The viewing of a measurement indicated by a measuring device used to measure the material object at the observer location (or very close proximity). This will be called 'proximal-measurement'

4.The viewing of an image of a measurement upon an image of a measuring device (the source of which is distant from the observer.) This will be called 'distal-measurement'.

Measurements are not all equivalent by virtue of being measurement. They are not one category. Each involves certain relation to substantial objects or images. These different methods are allowing comparison only of what is seen, observer's output image realities, and not comparison of what substantially exists. The order in which the processes of measuring and image production happen matters. The processes are non-commutative.

Only observed proximal object measurements can be assumed equivalent (because of the very high speed of light) to the magnitude of that dimension of the substantial object's form at the time of measurement. That cautionary advice, eliminating effects due to the way in which EM information is received, allows the barn pole type paradoxes to be intuitive.

Category error within "ON THE ELECTRODYNAMICS OF MOVING BODIES" by A. Einstein June 30, 1905. **2** [See under 2. On the relativity of lengths and times, the two operations (a) and (b)]

Methods

Quote "(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"

Quote: "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."

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.

Quote "(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."..... Quote "This we shall determine on the basis of our two principles, and we shall find that it differs from l." A. Einstein June 30, 1905. **2**

Comparison of methods

In scenario (b) the observer is not measuring the substantial object itself. The observer is receiving and processing EM radiation emitted or reflected from the to be measured rod object. That is processed into an 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) an object is measured and that measurement is observed; in (b) a manifestation (emergent image) is measured. Einstein 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"? He is mistaken because the assumption he mentions requires *that it is the substantial body (the material object) that is compared in both operations* but method (b) does not allow direct measurement of the object. There is now a category error because both (a) result and (b) result are considered to be comparable measurements because difference of category has not been considered. 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 category error.

Procedure (a) measurement protocol involves interaction with the object itself by the placing of the substantial measuring rod upon the substantial rod subject itself. That *procedure is done before* EM data from the ensemble is formed into an Image reality. EM sensory data 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 data arriving together, from the selection made at the selected time, is formed into the output 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 data is received and processed and it is the length corresponding to the length of the seen manifestation, not object, that is measured. *This is a different nonequivalent causal sequence of events.*

Amalgamation of information

It cannot be assumed that the image is necessarily identical to the substantial object. The image displays only an aspect of the topology as it is formed from only the sensory data that is received. Observer viewpoint, and relative motion, can affect which sensory data is amalgamated into the image. That allows sensory data with different temporal origin (from different configurations of the Object universe) to be amalgamated, giving an image containing temporal spread of information rather than being entirely uni-temporal like the source object.

Proximal object measurement gives an output with close resemblance to an aspect of the topology of the object, given that the optical system is not causing perturbation. With close proximity looking towards the object the EM radiation emitted together from the object is received together by the observer. However, it does not follow that the same is true for image measurement using an image produced from EM emitted from a distant source object.

The form of the image depends upon which EM radiation is intercepted and processed together into the output; whether there has been perturbation of the EM radiation en route and the optical or radio system used to convert the EM radiation input into visible output. Also for EM radiation that has propagated a very long distance it is not necessary that the source object still has existence either in the form observed or at all. The image viewed is not the object but output from relic EM radiation (potential sensory data.)

There should be differentiation of image outputs from source objects and not the assumption that there is equivalence. The form of the image is far more mutable than

the substantial objects form that is constrained by its substantial nature. The substantial objects form is due to the relations of the particles that are its substance. That is all of the acting forces including the atomic forces and chemical bonds that hold it together as an object.

Summary

The differences between substantial objects and images are not unimportant. Though they may bear the same object name they are not equivalent. The category error identified within Einstein's paper is not differentiating between externally existing objects, consisting of atoms and particles, and images being perceived (insubstantial manifestations, outputs of sensory data processing). That category error has led to a misunderstanding of the physics of relativity, and is cause of the associated paradoxes.

That does not mean that *relativity* in relation to electromagnetic phenomena, (affecting measurement), is a mistake. It is an important part of physics. Having clarified the categorical difference between material Object reality and product of information processing, Image reality, it can be understood that the two different observers in the paradox scenarios would be producing different Image realities from the amalgamation of potential sensory data received corresponding to their positions and motion through the continually changing EM information distribution (Data pool). The source material objects themselves cannot be seen, as sight requires that EM information is transmitted from object to observer and processed into output.

That the two observers see different Image realities is not paradoxical when it is considered that each has received a different selection of potential sensory data (EM information). Close to the speed of light the sub set of sensory data intercepted causes distortion of the (theorized) output affecting both the length of the observed objects and timing of events from the different observer viewpoints. It should be remembered that what *is* happening and what exists in Object reality is not identical to what is seen to be happening and what is seen to exist for these observers in these extreme (near light speed motion) scenarios.

As the scenarios are about what is seen, the acuity of the sensory apparatus and manner of processing the information is relevant to what would be seen. It is not only the EM input that affects what is observed.

Is the moon there when I'm not looking?

This question alludes to something Einstein purportedly said, recounted in "Einstein and the quantum theory", (Pais, A., 1979.) **3**, "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."

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 (measurement) 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 output of a monitoring or recording device, potential sensory data (EM information) pertaining to the moon in the environment, EM information 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 data, Moon manifestation or Moon-concept has not been specified, only an unspecific noun used.

Solution

KEY

A- Actualized, a substantial element of reality

Ab- Absolute, no singular reference frame applied

Category 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 data in the environment emitted by an actualized source object

Image reality- Emergent output reality from sensory data / measurement processing, Individual observer specific or objective via shared output or shared sensory data input

L- Limited (partial sample)

MS- Mixed state. A selection containing more than one state

M- Manifestation. Output of sensory data processing

Object reality- Foundational, source reality of substantial objects and particles and potential sensory data

Objective reality- Multi-observer corroborated Image reality

PSD- Potential sensory data

oMoon-Material source object Moon

PSDMoon…EM info. pertaining to oMoon

iMoon…Output of EM processing, image

PSYMoon… Concept/idea of Moon in thought and/ or records including memory

(Ab A S EOOR) oMoon	≠	(Goss Set A PSD) Moon
Absolute Actualized source Object		Total potential sensory data in environment relating to oMoon

(Ab A S EOOR) oMoon ≠ (D LFS PSD) Moon
Actualized Object Definite Limited fixed
state sub set of sensory data,
pertaining to oMoon
received by observer

(Ab A S EOOR) oMoon ≠ (D LFS M EOIR) iMoon
Actualized Object Definite limited fixed
state Output manifestation of
Moon I.e. (iMoon)

When not looking: there is no (D LFS PSD) Moon, the sub set of potential sensory data received by the observer (because no receipt is occurring), and there is no (D LFS M EOIR) iMoon, output manifestation.

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 data in the environment emitted by moon. The substantial actualized object and total sensory data 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 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.

Paradox

A paradox is a logical inconsistency. There are a great many of them and several different kinds, some of which are shown below.

Some paradoxes are sematic like the Liar paradox, "This sentence is false" or variations that retain the problem that if the sentence is false as it says then it must be true, yet if it is true it isn't false as it says.

"Russell's paradox is the most famous of the logical or set-theoretical paradoxes. Also known as the Russell-Zermelo paradox, the paradox arises within naïve set theory by considering the set of all sets that are not members of themselves. Such a set appears to be a member of itself if and only if it is not a member of itself. Hence the paradox." (Irvine & Deutsch. 2016.) **4** Related to Russel's paradox is the Barber paradox in which a Baber is considered who shaves all men who do not shave themselves and only men who do not shave themselves. The paradox arises when one considers whether the barber shaves himself or not, either way there is a paradox.

They also occur in physics, such as the temporal paradoxes of relativity that will be addressed here. They seem to suggest that something is incorrect or wrongly interpreted within existing theory to allow the paradoxical outcomes that occur. Though some argue that nature could be paradoxical and that is reflected in the theory. The paradox may even be revered by some as a wonder of nature.

Some suggest prohibiting rules or additions to theory to remedy the paradox. Such as for the Grandfather paradox only allowing actions that will not cause a paradox or creation of an additional time line to a new future for a traveler to the past. It can be shown that such tinkering with physics is not necessary as the cause of the paradoxes are understood as incompleteness of the theory. Piecemeal avoidance of the paradoxes is not enough, the theory in which they occur needs modification in such a way that all the temporal paradoxes are dispelled.

The Grandfather paradox

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

A number of possible solutions have been suggested. Such as the time traveler jumping onto an alternate past when arriving back in time. So, it isn't his own Grandfather that is killed but another version, or proceeding forward on an alternate time line after the fatal event. His original future remains unaltered, but he does not return there but to a different future. There being a physical rule that prevent 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. **5** Proposing that probabilities alter to prevent impossible outcomes.

Why the Grandfather paradox cannot occur

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

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

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

confuses Image reality with Object reality. *The Grandfather paradox is therefore based upon a category error*.

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

Substantial Object Manifestation

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

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

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

With uni-temporal space containing distributed EM 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. As there is no possibility of backward time travel even for particles; as there is no foundational time that is separate from the extant configuration of the uni-temporal Object universe.

If time travel 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.

The Andromeda paradox

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

Quote “Two people pass each other on the street; and according to one of the two people, an Andromedean space fleet has already set off on its journey, while to the other, the decision as to whether or not the journey will actually take place has not yet been made. How can there still be some uncertainty as to the outcome of that decision? If to *either* person the decision has already been made, then surely there *cannot* be any uncertainty. The launching of the space fleet is an inevitability. In fact neither of the people can yet *know* of the launching of the space fleet. They can know only later, when telescopic observations from earth reveal that the fleet is indeed on its way. Then they can hark back to that chance encounter, and come to the conclusion that at *that* time, according to one of them, the decision lay in the uncertain future, while to the other, it lay in the certain past. Was there *then* any uncertainty about that future? Or was the future of *both* people already "fixed"?” (Penrose. R. 1989.) **6**

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

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

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

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

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

So "Was there *then* any uncertainty about that future? Or was the future of *both* people already "fixed"? *(*Penrose. R. 1989.) **6** If for one 'observer' the event has happened in Object reality, and potential sensory information is in flight; it has happened for both. The event will have been superseded by more recent events and so be materially 'past'. Therefore, the invasion is a certainty (if all goes to the alien plan) because of the material occurrences, that are *independent of the distant observers*.

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

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 long enough. The different opinions on length are due to non-simultaneity of 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, rather than manifest, dimensions of the substantial rivet and hole can squash it. The relative positions appear different for the different 'observers' because- if they were both observers- they would be fabricating different experienced presents from the sensory data available at their location.

Amalgamation of different spatial/temporal information by each observer into what is seen produces different experienced presents within the same absolute foundational time, uni-temporal Now. The individual information derived products do not affect substantial objects that are not within the perceived space-time fabrication but are always only within uni-temporal Now, the existing configuration of the Object universe. What will happen is the substantial objects, material containing hole and the rivet, that are sources for both reference frame perspectives will come together in relation to their material object measurements and the different reference frame perspectives will cease to be relevant.

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 is around 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 the rod different lengths. 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, 2007.) 7

In Object reality neither pole nor barn are shortened. Differences in observed length are due to differences in the potential sensory data that is received and amalgamated together by the two different observers into their own product. Although Mark Iron's illustration is explaining special relativity it can also be thought of as an indication of how different sensory data obtained by the different observers is used generate their own Image reality products.

Twins paradox: Some ideas for consideration

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 traveler must accelerate out of orbit, cruise, decelerate, turn, accelerate, cruise and then decelerate for landing. The space traveler 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. [This can be thought about in relation to Image realities, formed from EM information receipt.] **Image reality, what is seen, does not (itself) affect Object reality**. (In other scenarios there can be an indirect affect, due to the behaviour of observers *in response* to the Image reality, leading to effects in Object reality).

In relation to Object reality: In a uni-temporal Object universe there is only one universal passage of foundational time, unaffected by motion. **Where the twins are located and how they move cannot alter 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.

Although the light clock argument is used to show that time slows for an object in motion, the light clock argument is flawed. Light, a periodic phenomenon, must be invariant in period with translation. That is a mathematical fact. So, period of a light clock is invariant in Object reality. A material change in time shown on clocks, like in the Hafele–Keating 'planes' experiment, is likely to do with the way in which time is measured by the clocks, and the effect of motion on that process (or experimental error.) That is an effect on the function of a specific type of system that can not automatically be likened to other systems operating in different ways. Like should always be compared with like for a fair comparison. The metabolism and ageing of a human being is not the same as the frequency matching of an atomic clock.

Magic (a short note of caution for physics)

It is easy to presume, from its demeanor, that a dog knows, with certainty, that the biscuit obscured from view still exists, as do most 4-year-old humans.

Magic is not mere illusion if material objects only come into existence upon observation. (As has been suggested by for example the participatory universe hypothesis of QM.)

Observation produces a manifestation from received EM data, it does not create substantial objects. The manifestation is only produced if the information from which to form it has been received.

Magic causes a subjective Image reality to be constructed by the audience members based upon incomplete information, playing to the "what you see is all there is" bias, the human tendency to draw strong conclusions from incomplete information. Daniel Kahneman, 2016. Such as the assumption of no support when a table leg is obscured from view by careful positioning of the magician's own body. A magician uses

misdirection, distraction and skillful handling / manipulation to control the subjective realities of the audience.

The rabbit most definitely is a physical (material) phenomenon while unobserved in the magician's hat. The live rabbit object has a structure and function including its biochemistry. The biochemistry involves atoms and particles and therefore also physics. A test could be done to show that the rabbit continues to function unobserved, and therefore exists somewhere. An experiment can be conducted with the rabbit to demonstrate its continued activities of living while unobserved.
Method -give the rabbit some (appropriate) measured amount sugar solution by mouth and measure the rabbits blood sugar after 2 minutes. Then leave the rabbit in the magician's hat and measure blood sugar again after extraction from the hat. Do the same thing for a rabbit not put into a hat. The rabbit not put in the hat must remain inactive to be comparable to the resting hat rabbit. So perhaps a clear container that permits it to breathe but not perform much locomotion would be required. A hat of the same dimensions made of translucent netting would be ideal as it restrains the rabbit in the same way as the magician's hat but it can be seen through the material. Compare seen and unseen rabbits.
If the magician's hat rabbit had disappeared and then reappeared when observed its blood sugar should still be high because there has been a halt in the insulin response while the rabbit is not in existence.
The magician can show that a hat is not required for the magic trick but a box can be used instead. This has the advantage of not needing a trained rabbit to stay concealed in a hat and so opaque and translucent boxes can be used in the experiment instead of hats.
Observations do not create material actualization but form manifestations that can be interpreted. The click of a Geiger counter is not the creation, i.e. coming into being, of a radioactive particle but an audible manifestation that can be interpreted as a radioactive particle. All the undetected particles are like rabbits in hats, not part of experienced reality but still having existence (in Object rather than Image reality.)
"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." Richard Feynman

Though Richard Feynman said the above, he doesn't seem to have taken it at all seriously. However, it is important. 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 than 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 be observed, beyond impoverished individual perception.

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.

Quote "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 obtained. (Faculty of social sciences. Radboud University. 2014.) **9**

“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.) **10**

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.

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

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