The map is not the territory

Georgina Woodward Aug2017

Sometimes we are interacting with the material world external to our bodies. We are also being influenced in many ways by received stimuli of many kinds. For example electromagnetic radiation affecting circadian rhythms, sudden loud sounds affecting hormone production, chemicals in food and air affecting appetite. We are not really "looking out". For much of our awake hours we are looking at images self generated from received electromagnetic signals converted to sensory information; and experiencing our internally generated perception, informed by prior knowledge, memory and received sensory input. So though we exist within a material universe we are also experiencing our self generated "virtual" representation and understanding of it. The external material reality and the information derived representation of reality need to be differentiated.

The difference between perception of reality, the meaning put onto the products of sensory information processing, and the "source" reality, Object reality, the reality existing independently of the mind is very important. There are two places in physics where that difference causes difficulty. One is Einstein's relativity in which seen things are regarded as Object things. Another place is in QM where observation (especially by a conscious agent) is regarded, by some at least, to be responsible for production of the external 'objective' reality. However the flow of information is from external source to construction of internal model, not from internal model to construction of external reality. The latter is magical thinking. Some evidence of this is given by neuroscientist Beau Lotto, in the video "Beau Lotto: "Deviate" | Talks at Google." (20.6.2017) [I]

With regard to quantum uncertainties: Some 'properties' are relative attributes rather than intrinsic qualities, unknowable until the 'viewpoint" /relative to what, is imposed. Measurement can interact with and alter the relation with object or phenomenon being considered, so that the measurement product is different from what would have been, unmeasured. There is the impossibility of simultaneously

2 having a fixed variable and the same variable changing, as pointed out by Werner Heisenberg. These are about knowledge and descriptions, points of view, definition of observations, effects of interaction with the observed. They are not about the nature of unobserved external reality.

Physics experiments interact with the material reality, they impose a viewpoint or context. That is to say, to know it there has to be a relationship with it that is defining. To illustrate: an object doesn't have a singular velocity though experiments will be done to find it. A man standing on a moving walkway has a velocity of zero relative to the walkway. Relative to a man walking at 5kph along the neighbouring pavement he is moving 5kph faster. Relative to the stationary pavement he is moving at 10kph. So what is the velocity of the man on the walkway? Like all objects in the Object universe he has velocities relative to every other object however they are moving, not one single velocity. Information received from the 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. In relation to the possible mismatch of perception and underlying reality, the possibility of natural (not man-made) illusion in relation to the double slit and half silvered mirror experiments is discussed in “Is reality really strange?” G. Woodward (19.8.2017)[II]. There is also alteration of what is being observed in Stern Gerlach, and polarizer experiments, the outcome of interaction.

Though there is no clear consensus it seems "knowledge' might be explained as 'justified true belief' 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 [III][resource]. A lot of the debate on what it 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 not what it seems to be. 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

3 facts. The more complete the true evidence the better the representation of events.

The Justified Misinformed Belief (JMB) terminology is helpful in stopping the arguments about what is and isn't knowledge when the thinker is misinformed but has a justified 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. Example: All swans are white -until the first black swan is found. And the other way around, supposed (according to available data and expert opinion) JMB can change to JTB when more facts are available at a later time. Example: a high fat diet can be healthy. This 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.

This is relevant to investigation of foundational Object reality. 'Sub information' (less than detectable quantum) would allow the effect of an illusion in double slit and half silvered mirror experiments. Sub-information that is undetectable (by us, with current technology), except indirectly by its interference might be justified true belief but unverifiable at present.

Analogy: 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, because the information receipt is necessary for the cognitive process providing the knowledge.

For full truth there needs to be not one impartial objective view but all relational views. Basing evaluation of truth on the reliable cognitive process comes to difficulties when the cognitive process itself is selective with the truth, I.e. only limited signals and results are obtained, that can be further reducing in their processing. It also combines evidence together that did not co-exit in the Source reality and the 'evidence' can be 'tampered with', subject to distortions, interference and absorption.

4 Certainly human beings can have power over the perception of reality by others by control of information. It is the art of magicians and craft of propagandists. Bending of light rays 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 lot is left out. It seems that there are multiple influences and scales of influence acting to produce a particular outcome. This may be a chink in determinism's armour.

About Variables

The word 'Variable' can refer to something that can potentially be known by measurement or calculation; a measurable. The measurement imposes a relative perspective ('relative to this') and quantifies or qualitatively determines something about the object/phenomenon relative to something else, or object/phenomenon- observer relationship. Variables can be placed into equations and there are such equations that represent relationships that have been identified by science. The equations obey the laws of mathematics and so variables can be expressed in terms of other variable components of them and can undergo mathematical operations. Knowledge can be about relationships, that can be represented as equations or algorithms. The variable that is measured in some way relates to (is correlated with) the measurement or observation *relationship* with the object or phenomenon under consideration ***that exists independently of the measurement made*.**

It is important that there is clear differentiation between 'the material world'/ 'Object reality'/ that reality existing outside of the mind and representations, 'physical reality'. The external reality *as it exists*, includes all the relations

5 between the parts. The parts, of themselves, are beables rather than measurables; existing things in physical reality. It is necessary to have both beables and measurables in science.
The beables are actual parts of physical reality, whereas the measurables are those variables used to gain some cognition of the external world. Those measurables allow construction of models and ideas about how that World/universe functions. Those measurables are found by the relation between the object of interest and something else providing a 'relative to this' context.

"Variable" suffers from the same problem due to lack of differentiation as Object nouns. A variable can be the 'character' of a natural property, or behaviour, or relationship, that is unmeasured. "Variable" also refers to the determined quantified measurement or determined singular qualitative state. One is an intrinsic part of external reality and the other is knowledge.

The lack of differentiation of variable category (into a part of external reality unmeasured or product of measurement), is similar to the problem of material object and the image of the object seen, (the product of processing of received electromagnetic radiation (EMr signal) with a distinct profile of frequencies and intensities) both being called by the same object name.
The radiation transmitted from emitting or reflecting object to receiver is not just a uniform signal emitted from a singular object. The radiation profile that is being emitted varies with the location on the surface of the source and variations in illumination. The observer will receive EMr with a distinct spatial, and temporal, origin profile, 'reflected' in the product that is generated.

The content of the signal transmitted from object to receiver can be regarded as information because a retina or photocell array (or other device) is able to convert the received energy frequencies and intensities into signals that can be incorporated into a product. From the 'point of view' of the emitter or any object or system incapable of turning the radiation into a product, it isn't information,

6 but to an object or system that can, it is information. So the boundary is abstract, one of 'viewpoint' even though those objects or systems don't have opinions. The differentiation of the radiation that has not itself changed, to being information from not being information, is to do with vocabulary and not physics. that makes 'information' as used here a word dependent on the kind of relationship an object or phenomenon has to objects in its environment. The EMr does not have a meaning *of itself*, it is just radiation.

The lack of differentiation of source and product is the category error in Einstein's relativity. The category error that is the reason there are the temporal paradoxes associated with special (and general) relativity models. As well as confusion about length contraction. That is to say, not realizing or acknowledging that any seen length is length of a product. For a seen image, that product is generated (in part) from sensory information. The sensory information is nerve impulses originating from stimulation of receptors by EMr signals emitted from the source. This means that signals emitted at different times can be amalgamated into a product (by human or device) that does not faithfully represent the length of the material object at any one time. Emr signals can also received by photo sensitive devices and processed into products. This fact shows the argument provided is not based on human psychology or anatomy.
Cognition of time obtained from received signals is cognition of the product generated not source reality. How and when the signals are received largely determines how and when the product is generated. (There can also be effects on the product generated from *how* the processing has happened. For more on this see David Eagleman's work [1V] [example].

It is not that ***time*** *is passing differently* for observer and observed but that it is seen to be because of the difference in rate of signal receipt from local and distant clock sources, or material clock time locally is compared with product of electromagnetic signal processing from distant source; not comparing like with like. (Emr signals carrying, what will be considered 'time at distant location',

7 information can also received by devices and processed into products. This is about physics not something confined to biology.)

In regard to differentiation of variable category, into a part of external reality unmeasured or product of measurement: Since the saying "the map is not the territory " is well known and used, perhaps it would be good to have Terrain and Map variables, abbreviated to T-variable and M-variable.

Some thoughts on M- and T- variables

M-variables are mostly singular value (or state) measurements or calculated values (or states), though some measurements might be expressed as a range to encompass variability or uncertainty. 'Wild' T-variables (Unmeasured and so unaffected by measurement protocol or apparatus) can have very many unmeasured values for the same variable because of the very many perspectives from which the measurement can potentially be taken. *Potentially all orientations relative to the thing measured* from a stationary viewpoint, and all orientations at all different possible speeds.

Orientation, direction, velocity, momentum, angular momentum and kinetic energy all being relative to something else, so relational.

Only some relations from the set of potential relations are actualized at one time. Actualized because there is a relation between material bodies, the object of consideration and another material whole or part that are both existent.

Once a decision has been made on a measurement protocol, rather than the wild actualized Terrain variable a variable restricted to those possibilities which will be measurable under the chosen protocol and selected apparatus is considered. So the existing WT variable in Object reality, is not part of the model of the evolution of the experiment. It has been replaced by a limited LT-variable by the mind of the experimenter/observer. (Though until measurement there is still WT-variable in external Object reality).

8 Example 1. Rather than having a coin able to be all orientations, (orientations relative to all 'viewpoints' of the environment external to the coin), the WT-orientation variable, it is restricted to two orientation outcomes heads/tails. Still unmeasured it has become in the 'mind' limited. Though that mental limitation of possibilities the variable considered is a Limited (orientation) Terrain variable. Though there is still in Object reality a WT-variable. When the outcome of the coin toss is obtained there is a singular M-variable state.

Example 2. Electron magnetic moment orientation prior to experiment WT-variable. The Stern Gerlach apparatus offers two outcome possibilities so the WT variable is limited to an LT- orientation variable. Still unmeasured it has become in the 'mind' an LT-orientation variable, but that limitation is only actualized by the experiment environment and protocol. The T-orientation variable profile (aggregation of all orientations relating to actualized relations) is also affected by the experiment environment (P(<>) represents that 'provocation' causing a change or 'power for change') So it is now a P(<>)LT-variable. The singular state outcome is the the M-variable.

M-variables are truncated according to measurement resolution whereas the unmeasured T-variable does not have a measurement resolution limit. The M-variables allow a singular viewpoint and limited resolution representation of the reality under consideration. IE they belong to the 'Map' representation. A particular way of looking at the reality under consideration. That allows an understanding without 'encompassing' all that it was/might otherwise have been seen to be.

<u>Clarification of terminology.</u>
Actualized- has become actual rather than imagined or theoretical.
Aggregated -collected together but not combined by addition.
Object universe/Material universe/Source reality/material reality/external reality/substantial reality/material world/external world/nature are all terms that

9 have been used to refer to the 'territory', the Terrain. Many different terms have been used to try and convey something about that 'territory' that will resonate with a reader. It is the abode of objects, it has substance, it contains material things, it is the source of information, it external to the mind and products of it. It has reality, it exists at a universal scale (everything that substantially or materially exists, or is a phenomenon within the 'evolving' material and substantially existent whole.) but can also be thought of in part when considering the World we humans occupy.

Image reality (what is seen) is a form of 'Map'. Image universe refers to constructs made from received astronomical information. It is is a 'Map' (that is known from many individual component Maps that have been produced. The component astronomical maps are heterogeneous in temporal origin of the incorporated information. The map therefore has a 'built in' temporal dimension, whereas the Source reality does not. The source is uni-temporal (same and only time everywhere) but containing signals of different temporal origins that are potential information for a suited receiver. This structure allows non- simultaneity of observed events but avoids temporal paradox.

The 'territory' has the potential to be known via many different Maps (produced from different perspectives/protocols.) The number of possible Maps an individual observer can produce is limited by apparatus and protocol and *the final singular result could be considered final 'collapse' of the possibility of more than one Map being obtained.* This is indicating that the 'Many worlds are not the product side of the experiment or observation but in the 'wild state of the' territory being investigated. In the form of the many possible observer-observed relations that could produce many different Maps.

As all actualized relations are equally valid for the wild territory variable then any singular Map representation of the variable, that does not represent that characteristic, must be inadequate. Not describing it fully but partially. For

10 analogy, 'a simple sketch rather than a fully 'rounded' sculpture.'
The variables are the ordinary kinds of variables talked about in physics. There are dependent and independent ones, as that terminology is used in physics. The M-variable is correlated with the T variable, interacted with via a particular relationship between observer and observed. The T-variable is unmeasured, independent of an M-variable description or quantification, i.e. knowledge.

WT-variables can be differentiated in to potential WT-variables, where those relations between the object or phenomenon and other potential reference objects, or apparatus, or observer are unknown. So it's values or states include all that are possible. The circle symbolizing wholeness or totality can be used to represent that. So in full that would give {Σ}OWT-variable. That {Σ}is showing that the variable is the aggregation of all values or states pertaining to all relations with the object or phenomenon under consideration, not addition of them.

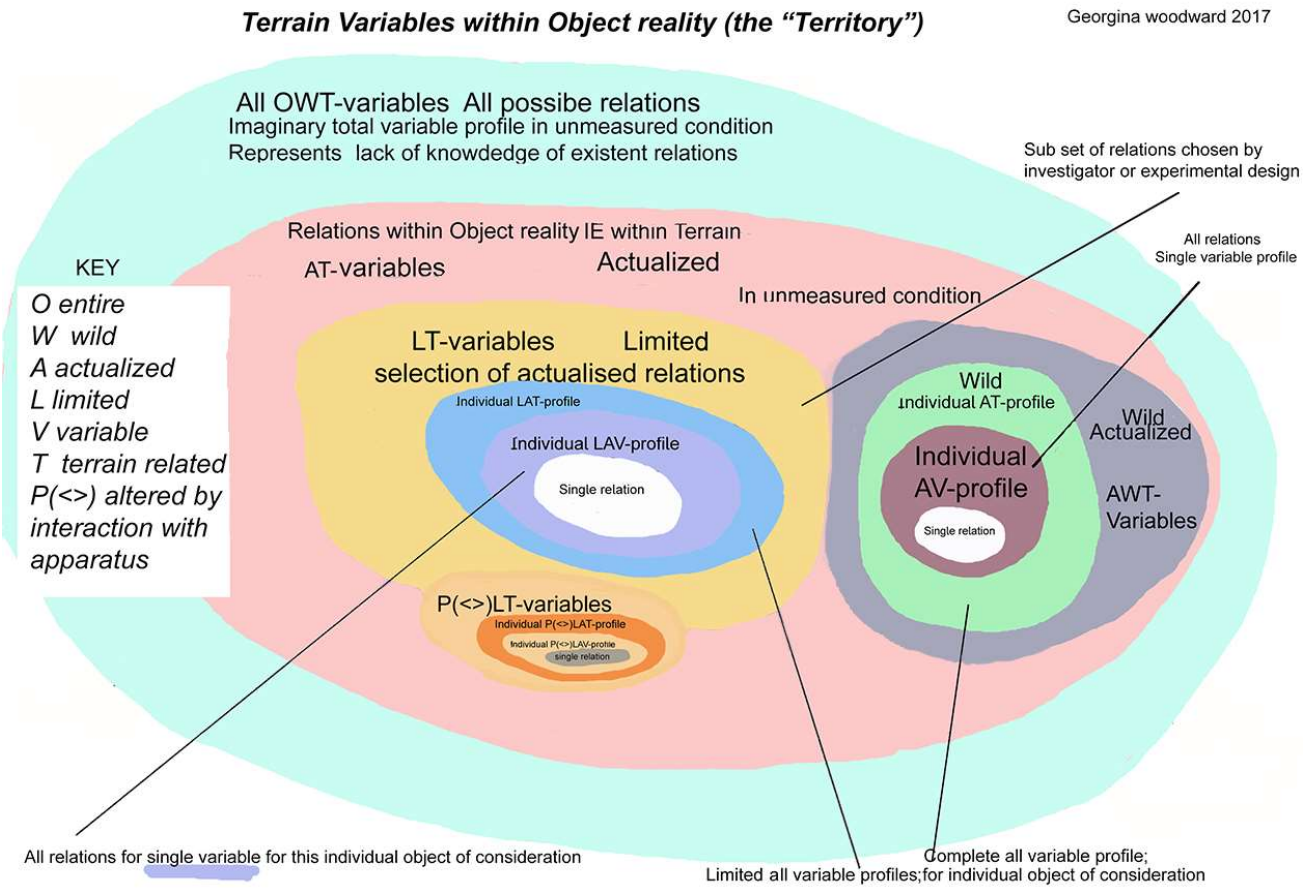
Another kind of WT-variable will be those that are actualized in Object reality because there is an existing relation; being all of those values that correspond to an existing relation with the object or phenomenon under consideration. That might be designated a {Σ}AWT-variables.
After {Σ}, representing aggregation, the following prefix of the Terrain variable shows if the aggregation is of all potential (O), or all actualized (A) relations.
The two kinds of WT variables are then imaginable as sets of values, the {Σ}AWT-variables being a sub set of the {Σ}OWT-variable set.

The Map variables are a separate, different category from the Terrain variable, depict-able at a different level. There is no union or intersection on a Venn diagram showing both categories. However in Object reality that there is *correlation* of Map values or states with relations between the object or phenomenon of consideration and the 'relative to this' reference object (or part). Also because the Terrain is all existing things the Maps have to spatially be within

11 the Terrain (but not within the set representation of the relations between Map and Terrain.)

Having the different categories of sets at different levels can be used to show the spatial but not categorical union. Lines or arrows linking the different levels can show correlations or indicate relations between Territory and map. Such as arrows representing the input of Emr from Territory (Object reality) to Map (Image reality) generating vision.

A Map variable value or state is correlated to a value or state in the the sub set of {Σ}AWT values, but because there may have been alteration during measurement interaction and because of the limits of measurement resolution not identical. Not being able to precisely replicate the WT-variable does allow some room for chaos in the (quantitative) gap between the knowable and the existent. Some randomness in the production of the singular Map variable values is attributable to one relation being established from the possibilities.



12 The diagram is not to scale. There are far more wild actualized variables in Object reality than (artificially) Limited variables Imagined states or value possibilities pertaining to an object of consideration.

Terrain variables

The coloured spots shown in the following list are Terrain variable group identifiers that can be used as a tally accompanying representation of the variable. The colour code can be used to communicate variable group affiliations of particular variable making their identification quick and easy. It will also help identify when variables belonging to different groupings are used together. This could help with identifying where errors or uncertainties are entering models of experiments for example.

- Single property Terrain variable types

- {Σ}OWT-variable is the aggregation of all values or states pertaining to all possible but not necessarily actualized relations with the object or phenomenon under consideration. An imagined variable of full possibilities.

- {Σ}AWT-variable is the aggregate of all values or states pertaining to *actualized* relations with the object or phenomenon under consideration.

L( )T: A limited consideration of only the local sub set of relations

- L({Σ}AWT)-variable A limited consideration of only a local sub set of values or states pertaining to *wild, actualized, local* relations with the object or phenomenon under consideration.

- L{Σ}LT-variable is a local sub set of values or states, the aggregate of values or states that pertain to relations *that are possible,* imagined *under the particular constraints* of measurement or observation (which may be due to apparatus or protocol or both IE. Limited.) An imagined theoretical variable of local relations that are possible prior to actualization of a subset in Object reality.

13 • L{Σ}ALT-variable is a local sub set of values or states, the aggregate of values or states that pertain to relations under the constraints of measurement or observation (which may be due to apparatus or protocol or both) that have been actualized.

- L{Σ}P(<>)LT-variable is the aggregate of values that pertain to specific relations that are possible under the constraints of measurement or observation (which may be due to apparatus or protocol or both.) Wild values or states being affected by the experiment environment or protocol.

Property Characterization ('Properties' are not singular valued but form a profile)
Static AV profile, (sAV): the many individual actualized variable values or states for a single property at a singular time.
Evolving AV profile, eAV: the many individual actualized variable values or states for a single property as they have evolved over time.
L(AV): the limited local sub set (taken into consideration)of individual actualized variable values or states for a single property.
The properties of objects that are under consideration do not belong to the object itself exclusively, as the word 'property 'implies, but in (Object reality, the Territory) are its relations to other existent things.

General Characterization: All properties Aggregation {Σ}AV
The wild actualized Terrain variable relates to one 'element' of the whole Terrain at uni-temporal Now (or a sequence of uni-temporal Nows if duration is a part of the make up of the variable), being the amalgamation of the values or states of all relations with that singular object/phenomenon.
Also for each object there will be an number of associated 'properties", and so the object will have an evolving profile of all of the Terrain variables which amalgamated is a full profile of many variables (the Actualized Terrain profile, AT-profile),each with their own with evolving value or state profiles; the Actualized Variable profile, AV-profile).

Terrain Profile types

OT profile: Amalgamation of all variable values and states relating to *all possible* relations to the object or phenomenon of consideration and for property types. Not actual but representing lack of knowledge.
AT profile: Aggregation of all actualized property AV profiles for object or phenomenon of consideration.
L(AT) profile:Aggregation of a limited local sub set of actualized property L(AV) profiles for object or phenomenon of consideration.

The actualized Terrain variable (for a 'property' under consideration), for a given object under investigation, is not a fixed profile of values, because either the object is moving, (or things external to it are moving, according to relative perspective). As the relations between it and those things external to it, are viewpoints ("relative to this") forming each actualized variable value within the aggregation of values. So the actualized Terrain variable aggregated value 'profile' will be 'evolving' over time.
Necessarily varying as there is continual change happening to the configuration of the Object universe (Terrain), that is foundational passage of time. That is to say all relations with the Object can not remain the same over time in a dynamic universe. There is a connection to an evolving wave function but this is aggregated variable profiles evolving. (Maybe an alternative to or alternative description of a wave function for anything exhibiting wave like, cyclic or oscillatory motion.)

Evolving AT profile set(of all variable types for an object/phenomenon under consideration) has many individual evolving AV profile subsets. There is a connection to the Many worlds idea (potential for many Maps at the source, not many Terrains on product side).
The Terrain (material, substantial, Object universe, that is the reality that exists outside of our minds and representations), is more than singular 'Map' representations encapsulate. There are many ways the Terrain can be interacted

15 with and represented and so one deterministic Map doesn't show any of the other possibilities that have not been put into the 'Map'. What is seen and perceived is itself a 'Map' representation and not the 'territory',The Terrain. A seen image is formed only from the limit Electromagnetic ingratiation received and not all of the information emitted into the environment from the source object. EG. A cup is seen from the handle side alone not also from above, below, opposite side, other 2 sides and at all possible angles of orientation in-between.

The actualized Terrain, AT, itself is the material Object universe at uni-temporal Now. The wild actualized Terrain variable relates to one 'element' of the whole Terrain at uni-temporal Now. Though when W{Σ}AT-variables involving duration are involved there is consideration of what has happened over a sequence of configurations. Which can be designated (t)T So that also relates to the sequence of configurations imaginable spread along a time line (not a dimension of the Object universe.)
W{Σ}AT-variable being the amalgamation of the values or states of all relations with that singular object/phenomenon. Necessarily varying as there is continual change happening to the configuration of the Object universe (Terrain), that is foundational passage of time. That is to say all relations with the Object can not remain the same over time in a dynamic universe. IE There is a connection to an evolving wave function but this is aggregated variable profiles evolving.

Characterization of Map variables

Map variables are of two kinds those that are obtained by direct measurement of the object, such as proximal measurement of the length of an object by placement of the standard scale on it. The Terrain variable is not altered by the act of measurement in that way but the map value obtained will be affected by the reliability of the scale (eg. consider does it expand /contract in different temperatures) and the limit of resolution of the scale used. This kind of map variable can be designated M-variable. It has a singular value unless it includes a range to show uncertainty (<>)M-variable or a range of values over time

16 (t)M- variable. The other kind of Map variable is a value (or range) that has been affected by interaction of the object under investigation with the apparatus or by 'interference' by the protocol employed, P(<>)M-variable. (I)M-variable are another group of Map variables obtained form received information not by direct interaction with object of consideration.

Map variables

M-variable	Map variable
(o)M-variable	Map variable obtained by direct proximal measurement
(t)M-variable.	Map variable spanning time (a -Now sequence)
(<>)M-variable	Map variable with range of uncertainty
P(<>)M-variable	Map variable affected by measurement
(i)M-variable	Map variable obtained form received information not by interaction with object of consideration.

A Map variable could fall into several of the groupings within the Map variable category. For ease of communicating and helping others with identifying the group affiliations of the variable, when representing it an accompanying colour tally or chart could be constructed using the identifying colours for the different groups.

Map variable group identifiers.

- M-variable
- (o)M-variable
- (t)M-variable.
- (<>)M-variable
- P(<>)M-variable
- (I)M-variable

Variable X ●●●● Variable Y ●●●

17 This makes it easy to see at a glance when different sorts of variables from the Map category are being used and how they differ. If all terrain variable are identified firstly as • followed by Terrain variable group identifiers, it will be possible to see at a glance that Map and Terrain variables are being used together, which can cause problems and paradox.

An example of conversion from relative relations within Wild Terrain to Map

1.START -{Σ}OWT-variable: All possible relations. Imaginary total variable profile in unmeasured condition, representing lack of knowledge of existent relations.

2.NEXT OBSERVER STEP: from considering all that could possibly be to considering what is .Here represented as
{Σ}AWT- variable: All actualized relations in unmeasured condition4

3.NEXT OBSERVER STEP:[Experimental /observation choice{Σ}LT-variable: limited selection (chosen by observation method/design)]. Mental process. May be represented in some way.

4.NEXT INTERACTION WITH TERRAIN OBJECT OR PHENOMENON
{Σ}AWT- variable :: 'evolution' of the variable profile from the natural wild state to the limited state by interaction with apparatus environment OR restriction of sampling to limited state LT values or states

5.NEXT RESULT OF 'EVOLUTION' OF VARIABLE
{Σ}ALT- variable: OR {Σ}P(<>)ALT-variable: Actualized Limited state LT variable due to previous choice and protocol or method. (Where akin to rabbit entering the magician's hat, the outcome state is becoming actualized unseen.) 'Evolution' towards what has been called wave function collapse or decoherence in QM. Physics happening.

6.NEXT OBSERVER STEP Change from considering Terrain (territory) to considering (Map variable) result. Change in mental focus. Superposition model no longer applicable to new circumstance. IE Collapse of usefulness of the model.

7. NEXT STEP RESULT OBTAINED

M-variable OR P(<>)M-variable
Observer can now say that the wave function collapse **has** happened as there is a singular outcome
8. Map construction:
processing of variable or collection of variables into Map

It can be seen form the earlier discussion that while the variable profiles are evolving the they are not the *same as* fluctuating outcome probability distributions but they have a bearing on the outcomes. Rather they are changing relations with things external to the object or phenomenon under consideration;

The source of the outcome distributions, but not an amalgamation of the possible outcomes preexisting interaction with the environmental conditions and influence of the relations with it that are causal.

Logic and truth values

There is a problem with applying the truth values [true or false] to the 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 viewed one side by a and the other side by B); There is a boat. A yes = true, B no = true. There is s a cat A no = true, B yes = true. There is a cat and a boat {A, B} yes = true.

19 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 (its 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 phenomena observed/measured and not to the relations between the object and a reference (relative to this) viewpoint. The individual viewpoint that gives a true truth value is not regarded as partial but true. However despite seeming contradictory and raising suspicion of being counterfactual that is what the amalgamation of different perspectives is, and that is a more complete truth than the partial analysis. Its only odd though because it is a different way of thinking about properties and variables.

This model therefore requires another kind of logic – the logic of aggregate viewpoints. With which it can be seen that even opposite, seemingly contradictory truth statements can be aggregated into a larger truth.

<u>On vision and other Maps produced using received information and the relevance to interpretation of Einstein's relativity</u>

The lack of differentiation of variable category is similar to the problem of source object that is observed and the image of the object seen, (the product of processing of received EM 'information') both being called by the same object name; The category error in Einstein's relativity and source of the temporal paradoxes. As well as confusion about length contraction. That is to say, not acknowledging that any seen contraction is a product of the construction of the product image, from information emitted from the source at different times. Not an observation of the change in length of the material source object.

20 That it must be a generated image comes from the way in which vision functions by receipt and processing of electromagnetic radiation, which serves as information. The construction generated relates to the information received and not the current state of the source object.

The way in which the present is constructed from received information and that information is different for different observer positions and motion gives rise to non simultaneity of events perceived via the senses. This also allows temporal differentiation – the seen Present being a Map from information of different temporal origins, whereas Uni-temporal Now is the temporal expression for the Terrain. Change in configuration of the Terrain giving sequential foundational passage of time.

The experienced visual Present can be regarded as a Map generated using frequency variable data and intensity variable data obtained by the relation of the cornea to the information within the external environment, which together with the lens and aqueous and vitreous humors focuses the radiation on the light sensitive photo-receptor 'array' of the retina. The Map is a map of the information, which is interpreted by the brain as showing the material external world. Even though the seen images are partial representations of the whole objects (constructed only from the information received from an individual viewpoint) and scale of them varies with distance, whereas the solid objects themselves (in Object reality) are not variable in scale according to how they are being observed.

Similarly Maps can be produced with devices such as cameras and telescopes connected to computers. The frequency and intensity variables 'measured' because of the devices relation to the information in the environment (IE what information is received and the relation to it, resulting in the measured variable value) are converted to display or photographic image or measured variables profile that can be artistically converted to a Map image.

21

On the accuracy of maps in relation to 'Maps'

As relativity is generally understood, what is seen [the product from received EMr] is taken to be the external reality, of objects in space-time. This has happened because of a category error. Measurements of seen images are muddled with measurements of material objects. The necessarily 'sens-able/detectable information' derived space-time universe is taken to be THE reality, the universe. As Space-time *has to be* the generated location of the seen product, because of the way in which vision works using received EMr, the foundational source of the seen 'image' is not in space-time along with the product. The train measured from a distance is not a material train. Nothing in 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 category error is also the cause of the paradoxes associated with relativity.

QM produces very good predictions. Not sufficient to consider the 'picture of quantum 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 map to be complete reality, for accurately predicting the order of stations and line exchanges only occurring at marked junctions. Though the spatial journey of a passenger on the material train does not correspond to the spatial changes shown on the map. Harry Beck's 'Tube' map [V]. The map is designed for ease of use of the network. The map represents some aspects of reality accurately; ordering of stations, and correctly indicated line junctions where passengers can switch lines.

The spatial distribution of the network, that is its correspondence to spatial geography has though, been forfeited. It is spatially/ geographically highly *inaccurate* in order to give simplicity of function, that is ease of use. The layout of the map has no doubt caused some traveler's confusion in regard to actual distances travelled between marked stations. Research on this is published in a

22 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" [VI] Zhan Guo, (2011). 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 map is constructed from information about the network and conveys that information accurately, but it does not fully correspond to the reality that is the underlying reason for it IE the material 'tube train' rail network with a particular spatial distribution in material reality. The relevance to physics is this provides a refutation of the argument that a model with impressive predictive power must be accurately modeling 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.

Conclusion

The important difference between variables in Object reality, reality existing independently of the mind, sometimes called physical reality has been discussed.

Variables have been divided into terrain (t)/● and Map (M)/● variables. There has been categorization of terrain and Map variable groups. The groups have been given colour identifiers so that each variable representation can be accompanied by a tally or chart showing the variable groups to which it belongs. Variable profiles (single variable type profile) and Terrain profiles (Multiple variable type profile) have been introduced.
Variation in Terrain profile over time has been likened to and contrasted with a wave-function and outcome probability distribution. The changing Terrain profile associated with the object under consideration provides a new way of thinking about what is happening at the quantum scale during experiments. The way in

23 which variable profiles are changing because of changing relations with surroundings, and because of changes in the way the 'property' or variable is regarded during the progression of an experiment is considered. This provides some insight into where physical changes are happening that could be regarded as the physical manifestation of what has been portrayed as wave-function collapse. Where/when the outcome comes into being. It also identifies mental alteration in regard to the variable as a change that is collapse of the usefulness of the earlier representation. Finally the result is obtained and the single fixed state or value is promoted to representation of the property of the object or phenomenon considered. This might also be regarded as where the usefulness of the earlier representation finally 'collapses', as having knowledge of the result there is no possibility , even in the mind of the observer, of a different outcome result remaining, in 'the known universe'.Though the Many worlds model has suggested there could be other results in other versions of our own universe.

The three different stages all associated with wave-function collapse in QM are different kinds of event. The first is where the multiplicity of value or states ceases to apply, the second where it ceases to be considered, and third where it is superseded by the known singular state or value.
It has been demonstrated that it is possible for something to be highly accurate in some regards but also inaccurate in other regards, by example of the Harry Beck Tube map. That demonstration was given as an analogy for quantum physics wave-function superposition models. That allow accurate prediction of outcome probabilities but probably do not accurately model what is occurring in Object reality.
The concepts of truth, logic and knowledge have been discussed and it has been shown that old ways of thinking need to change in order to accommodate the expanded non partial perspective of Object reality. Including superficially contradictory states and non unitary 'property' values and states, at all scales not just the quantum scale. A measurable in physics is a relationship and not a property possessed by an object of itself.

References and resources

[I] Example video Beau Lotto: "Deviate" | Talks at Google (Published on 20.6. 2017) URL=www.youtube.com/watch?v=hQUgGg9XzbQ&t=148s

[II] Georgina Woodward, Is Quantum Physics Really Strange?, (19. 8. 2017). http://vixra.org/pdf/1708.0235v1.pdf

[III] Ichikawa, Jonathan Jenkins and Steup, Matthias, "The Analysis of Knowledge", *The Stanford Encyclopedia of Philosophy* (Fall 2017 Edition), Edward N. Zalta (ed.)

[IV]Example Video, David Eagleman, Oct 4th 2011, Published by FQXi.org URL=www.youtube.com/watch?v=MkANniH8XZE&t=4s

[V] Harry Beck's Tube map - Transport for London. https://tfl.gov.uk/corporate/about-tfl/cultureand-heritage/art-anddesign/harry-becks-tube-map

[VI] 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.

[VII] FQXi.org Thanks for inspiring content and helpful discussion platform