The Hard Problem

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Considers what is meant by the 'hard problem of consciousness', and what sorts of questions, tools, and techniques would be necessary to address it. Identification with the concept of time is proposed and connections between that concept and the notions of 'choice', 'change', and 'causality' are developed as a basis for the real, as conceived within the context of the scientific method. Using established relations known to exclude hidden variable theories, an identification of the temporal arrow with 1st person experienced randomness is explored as a basis for resolving the hard problem.

How is it that an organic system can be personally and directly experienced as having the attributes of intentionality, mind, and consciousness, when it is also regarded as uncontested truth that the inorganic physical substrate out of which all of all of such systems are inherently composed is completely and perfectly void of such characteristics?
In other words, how does a 1st person experience arise from purely 3rd person reality (ie, as patterns of impersonal physical matter interactions, etc)?

In order to address 'Hard Problem' questions like this, it is necessary to identify exactly what the 'problem' actually is about. 'Intentionality', 'mind', and 'consciousness' are all ideas that inherently involve an assumption of 'being in time', whereas our theories and models of physical matter do not. Consciousness is always a 'consciousness of' something, at a given moment. Intentionality is always considered with respect to the resolution of a future state, with respect to some other moment, which is regarded as the present. Mind, in the process of thinking, perceiving, self awareness, etc, is considered a process of flow, which in itself implies a temporal direction, rate, and relative position.

Yet when considering the theories of physics, models of machine learning and computation etc, no specific moment of/in time is 'special'. Every moment is equally likely to be 'the present' -- no such moment is inherently 'tagged' in this way. Within physics and its mathematical modeling, time is a typed dimension of space, and any declaration of an 'origin position', 'direction', and 'scale' is strictly arbitrary. In theory and in modeling, any coordinate system can be mapped into any other.

Therefore, it is inherent in the deep nature of all such questions relating to the 'hard problem' that there be a reconciliation of the question: "how does a 1st person experience 'of being in time' arise from 3rd person reality which can be fully understood in a manner which is strictly atemporal?".

In other words, why do we have 'an experience' which is 'in time' at all? What accounts for the difference of information access between a 1st person perspective, where we do not and cannot know the future, and a 3rd person perspective, which can in theory access all moments equally?

All other questions, related to what it means to "be knowing", or "self aware" (the epistemology of consciousness), or in terms of the principle of information locality, information processing complexity, the identification of neural correlates relating brain areas to actions in the mind, are secondary issues to the more basic question of how to handle the concept of time[(1)]. Our being unable to physically observe a difference between 'mind bearing systems' and 'non mind bearing systems' (ie, as just so many informational signals moving through 'stuff', networked patterns of pathways, etc), is an extension of the degree to which, within a 3rd person context, there is no singular moment, no unicity to any particular temporal 'origin position', 'direction', and 'scale' -- without which the notion of a 1st person specific perspective cannot make sense[(2)].

When we think about 'events' in models, physical theories, in systems like computers, we do so from the outside, looking in. There is an implied ability to access and measure the signals at any location, and with respect to any state, in the (presumed) totality of the model/system/theory.

Yet when we think about systems like selves, we do so from the inside, looking out. Practically, we do not have access to, and moreover, not even theoretically, can we assume a possibility of access to, any other moments of space-time than that one with which we are currently, presently, and locally associated with.

We do not have access to any of the available 'universe states', except in proportion to their being proximate to our local past, and even then, only in a very limited way. The activities and events that might be occurring, even in an infinitesimally short duration into the future, are fully, completely, and irreducibly inaccessible to ourselves in the now. It does not matter how close -- how short the duration -- in the future, or in the past, any given event or occurrence may be, we only and strictly have access to what is occurring in the now.

In every purely causal system, every state is in explicit relation to every other state, and therefore, a model of the inter-relations of all states is perfectly defined and definable, deterministically, for all points along its 'evolutionary trajectory'. This is the essence of what makes such modeling useful -- the ability to access anything anywhere, and thus to predict the future, using the tools of a presumed 3rd person perspective, so as to overcome the limits of access, what we can perceive and know about future states, when operating in a 1st person perspective (ie, which we cannot not otherwise be in).

Therefore, it is for sure the case that what distinguishes 1st person personal perspective from the 3rd person impersonal perspective of physics, is time. In the personal sense (1st person perspective), the 'time' defines boundary of what is known, knowable yet unknown, and what is forever, fully unknowable (ie, distinguishes the absolute past and the absolute future from the 'is accessible now'). In the impersonal sense (3rd person perspective), the notion of time does not 'exist' at all -- it is fully an illusion, and cannot be regarded as a target of study in a scientific manner.

Time cannot be an object of scientific study, insofar as the very method of science (however conceived) inherently assumes the notion of time in its very practice. What meaning can be put to the notion of 'performing an experiment' so as to 'obtain measurable information' about the 'state of the universe' if all three of these concepts have already presupposed the 1st person perspective of time?[(3)]

Moreover, the requirements of 'observability' and 'repeatability' of 'causal relations' each also impliy and assume either a 1st person perspective, as a locality in space, or a notion of locality in time, or both. These three concepts are at the core of the very most basic assessments of the meaning of the scientific method -- of science in itself. As such, more than just being 'a hard problem', reconciling the notion of time purely and only just within the domain of science alone (the theory of analytic objectivity) is actually fully, fundamentally, and characteristically impossible.

Science has (cannot not have) its epistemic basis in a 1st person perspective, thus assuming time, and only from that basis can there be an attempt to make ontological assessments about the nature of reality, as an output formulated in the therms of 3rd person models, theories, algorithms, etc.

As such, there can be no question that the basis of the theories (the process) is in some irreducible sense more real than the theories (the outcomes), and that therefore, the 3rd person perspective is 'constructed out of' the 1st person perspective.

Therefore, insofar as the totality of the 'hard problem' is actually subsumed in questions about time, everything else about what makes consciousness 'special' is to be considered relative to this basis.

The three major questions about time:.

1 *The unicity aspect of time:*
Why is this moment experienced, and not that one?

2 *The asymmetry aspect of time:*
Why does time only flow in the 'direction' it does?

3 *The scale constancy aspect of time:*
Why does time move at the rate that it does?

The Irrationality of Choice

A concept that is also frequently connected with the nature of minds, self, consciousness, intentionality, the subjective, etc, is the notion of 'choice'. Insofar as much of the philosophical debate regarding the nature of the relation between mind and body has historically been concerned with the notions and meanings of 'free will', 'choice', 'agency', 'intentionality', etc, whether such exists or is 'real' or not, what nature it has, etc, it is also helpful to consider these concepts in connection with the 'hard problem'[(4)].

In this context, the particular dilemma that occurs is how to reconcile the notion of 'freeness', self determination, etc, as subjectively experienced, 1st person, with the notion of 'fixed', as defined by the apparently complete mathematics of the 3rd person physicalist perspective. If someone were to posit free will, then they are effectively also positing that there is somewhere, somehow, and some-when, some (any) change that occurs (anywhere, or any-when in the universe) which is also not causal, not caused, and in that way, not deterministic, which as a concept eventually extends to include the notions of 'not rational'', 'not reasonable', irrational, and therefore 'just plain wrong', etc.

Insofar as there are strong injunctions (claims) in both directions -- that the 1st person perspective is not (generally) real and that only the 3rd person perspective is valid/truthful, and alternately, that the 3rd person perspective actually depends on the 1st person perspective, as the ultimate establishment of what is meant by 'truthful', 'scientific', 'sound, valid, and reasonable', etc -- is is clear that an even deeper level of conceptual tools and methods will be necessary to reconcile these claims; some sort of metaphysical theory of truth will eventually be needed.

The question of how to reconcile choice, agency, intention, etc with the evidence of physical determinism, needs to be resolved in terms of different operational levels of scale. The situation is something like an 'epistemic sandwich': two hard layers, in the form of a 3rd person perspective at the scales of the microscopic and macroscopic (the theories of QM and GR respectively), surrounding a soft center, a 1st person perspective at the scale of the mesoscopic which is attempting 'to reach out' into the periphery and understand the universe.

As such, it is to be noticed that the notion of 'casualty', operating at the level of the mesoscopic (brains, bio-organic neural networks, software programs running on real computers, etc), is strictly and fully conceptually distinct from from the notion of 'determinism', operating at the level of the extreme microscopic (the interactions of Standard Model particle physics as described mathematically), or at the level of the extreme macroscopic (the eventual heat death of the universe)[(5)].

In this regard, while it is reasonable to consider the notion of 'choice' (as a proxy for 'free will', 'agency', 'intentionality', etc) in contradistinction with the notion of 'causality', and while it is also reasonable to consider whether the universe is 'deterministic' or 'non-deterministic', it is **not** therefore valid or reasonable to consider that either set of these concepts, (inclusive of the element concepts themselves) is in some/any direct relation to the other set of concepts. Choice, Change, and Causality, are at the same 'epistemic level' (a proxy for the concept of scale), whereas completed determinism and completed in-determinism (ie, pure randomness) are concepts at a different epistemic level.

Therefore, to properly relate these two levels, and therefore have some basis on which to reconcile these relationships <-- "is our reality fully causal or are some elements of agency real?" and "does reality admit of free choice?", etc --> we need some sort of 'impedance matching geometry' between the scales of the macroscopic and the scales of the microscopic. The notion and the concept of time appears to operate very differently, depending on the scale of the consideration. To understand the nature of time more fully, so as to resolve the hard problem, there is a need to be able to account for this difference.

Choice and the Bell Theorem

Searching for an example of the kind of necessary coupling that occurs between the scale of the microscopic (3rd person) and the scale of the macroscopic (1st person) finds the work of John Conway and Simon Kochen and their paper "The Strong Free Will Theorem". While that paper is about formally and finally precluding any possibility of the development of an internally consistent theory of hidden variables in Quantum Mechanics (QM), there are other important layers of inherent implication.

In particular, there is developed a relation between the notions of 'choice', as evident as an assumption in the practice of the scientific method, and the notion of 'in-determinism', as a statement about the prior existential state of an entangled particle[(6)]. On the basis of an actually experimentally verified effect, and insofar as we regard that QM theory is correct, there is made a strong connection between an epistemic process at the level of the 1st person, to an ontological claim about reality, at the level of the 3rd person. That is a remarkable result, and is of particular importance regarding our current inquiry.

Rather than attempting to establish whether the notion of counterfactual definiteness is applicable in a general sense, which would be an involved debate in itself, we can instead consider that all that need be regarded as established is that there is now a relation of correspondence between the occurrence of the concept of 'choice', on the part of the scientist doing science, and of a kind of inherent 'hard randomness', on the part of the particles and interactions that ostensibly compose the substrate of reality. Note that this is not to assert whether both 'experienced choice' and 'intrinsic randomness' are "true", but rather to assert that both of these are either co-occurring, each at their respective scale levels, or that neither of them are occurring at either level.

Although there is no formal conclusion stated in terms of whether 1st/3rd realities are either intentional or non-intentional, it is the case that in either situation, either way, a strong statement has also actually been made about the nature of time. Insofar as an assumption of the temporal is inherently an aspect of 'making a choice' and insofar there is also an assumption of temporality in the means and methods of 'measuring a particle state', and thus of 'resolving' it to a definite state, as a kind of irreversible transform from 'previously unknown' to 'afterwards knowable', then it becomes possible to actually compare and contrast these two particular assumptions about the nature of time in a formal and definite, conceptually fixed, way.

Time, as considered at the scale of the mesoscopic, is considered entropically, as being the statistical results of enormous numbers of single particle interactions, at elevated temperatures, chaotically composed into systems of such high complexity and information content as to be effectively unmeasurable and incalculable, in terms of purely QM micro-states. And yet Time, when considered at the scale of the microscopic, when in the process of measuring the spin state of one particle, representative of a single entangled system, is regarded in terms of a pure asymmetry of information flow. This concept of time is not to be regarded in terms of any sort of deeper entropic state[7].

In other words, there is a real concept of a non-entropic arrow of time, at a physical level.

Insofar as it is regarded that the macroscopic is composed out of the microscopic, then it is also to be regarded that the non-entropic arrow of time is actually be more fundamental one, in a strict physicalist sense, and that the 'ordinary' entropic arrow of time experienced at the level of brains is, if anything, in addition to or 'on top of', the more fundamental non-entropic arrow. Therefore, it is only the non-entopic versions and concepts of that arrow that we need regard as important.

However, insofar as the 'reality' of the entropic arrow of time is uncontested as 'real', at least at a 1st person perspective, and insofar as this 1st person arrow of time has been put into a kind of strict correspondence with the 3rd person non-entropic arrow at the scale of the microscopic by formalism of the Conway and Kochen paper, then therefore, we must also accept that this non-entropic arrow at the foundational level of QM is actually also real, applicable, etc, in some final way.

Notice that these considerations, regarding the nature of time, would remain valid regardless of any particular assessment as to whether our 1st person sense/experience of 'subjective choice', 'agency', 'intention', etc, was the purely the result of the mutual chaotic motion of all of the compositional elements of our brains, environments, etc, or even whether our 3rd person assessment is that at some deep level the nature of practical interaction reality is inherently and irreducibly random, indeterminate, mathematically irrational, etc.

On Choice and Randomness

From the forgoing, we have established some important relations between the nature of the concept of time, as it occurs on different levels of scale and in different modes of 'person', and certain other concepts, also occurring at distinct levels, like 'choice', 'causality', 'determinism', and 'randomness'. Entangled with the acceptance of non-entropic arrow of time as real at the level of the 3rd person microscopic, we find also an assessment that that microscopic substrate of reality is also, at least to some partial extent, non-deterministic and hard-random (ie, that no concept of a definite particle state as 'ontologically existing' prior to measurement, can be substantiated, since by definition it is explicitly the case that there is no valid epistemic process by to establish that ontological assumption).

However, even with the acceptance of a fundamental in-determinism in the level of a 3rd person material reality, and that therefore, in at lest some respects, there are 'un-caused' changes within reality, that fact in itself is not equivalent to a thereby established statement of 'truth' of a notion of 'intentionality' and 'free choice' at the level of the 1st person experience.

As such, there are two alternatives in how the notions of 'choice' and 'intentionality' may be regarded. In one view, the sense of the 'freedom' of 'felt choice' could be regarded as directly equivalent to, and a direct result of, randomness, and of our innate pattern seeking abilities to become engaged in the service of 'rationalizing' our random (unpredictable) actions to ourselves as being 'chosen'. In another view, we can regard that the term 'randomness' is a misnomer, insofar as it is at least potentially the case that all apparently random states are actually cross correlated -- entangled -- in some unknowable and unmeasurable way, and therefore potentially meaningful, even if such meaning is largely likely to be fully and/or completely unknown to all others outside of the subjective self.

Therefore, the notion of whether we regard choice, intention, and/or randomness as inherently meaningful or meaningless is more about whether one prefers an orientation which is based in the 1st person perspective or in the 3rd person perspective, since at the level of brains, the specific selection of particular states out of the range of all possible states is both unobservable and non-computable, even in principle, whenever fine details of what is happening at the level of the microscopic is eventually influential as to the particulars of what happens at the scale of the mesoscopic. The more sensitive and delicate the balance of the brain, the more unknowable the nature of the mind.

Conclusion

The relation between a 1st person perspective on reality and 3rd person perspective on reality is not one of mutual contradiction. Both perspectives have a single common temporal ground, even if differing areas of utility and application, how the notions of randomness and causation are treated, etc.

To have a predictive model, it is helpful to 'factor out' the notion of time so as to be able to enter 'initial conditions' into a well defined mathematical model and 'read off' an anticipation of an (presumed eventually) measurable future state. To agree that there is significant utility in this 3rd person mode of relation, is not to require that there is also an attendant ontological claim that such methods are the 'only' ways in which systems of utility can be established (ie, as if to assert that no form of 1st person thinking could have utility), or moreover, to make a stronger ontological claim that the models of QM are the final, absolute, only, and complete basis for thinking about reality itself. Neither of these 3rd ontological assumptions make sense, particularly insofar as they themselves would need to, ultimately, be grounded in terms of experiment -- which a 1st person activity in any case. The use of '3rd person systems' is grounded in, and embedded in, a 1st personal temporal reality, as a generalization, rather than the reverse.

How is this work a novel improvement in the general knowledge?

It strengthens the observation that the immediate 1st person experience of random events, insofar as they do actually separate cause from effect, antecedent from consequent, and yet, while real, are also fundamentally impossible to predict on the basis of any amount of prior (objective) knowledge, as processed through mathematical theory, models, algorithms, etc, provide the ultimate basis of what is meant by the 'arrow of time', as distinct from the otherwise purely symmetric state evolution, the timeless patterns of our (otherwise useful) mathematical models.

Any event which is inherently and intrinsically unpredictable by theory, in its actual occurrence, is an interaction where a future is distinguished from a past, with respect to an immediate personal observer (only), in a manner that is inherently detached from the capabilities and temporal symmetries of that theory.

As such, the notion of a '1st person observer' being grounded in time, as an epistemic reality, is not actually in contradiction to the general usefulness and utility of thinking about 3rd person ontological reality as being modeled by a-temporal mathematics, as long as the notion of a-temporality is not then therefore assumed, by that usefulness and utility, to be a "Truth" applicable to the totality of the universe (all that is physical).

Both self (1st person) and universe (3rd person) co-occur and co-evolve in time, and as such, it is natural to expect that our theories and models of both -- the tools that we use -- will also co-occur and co-evolve in time as the needs for them also change.

Notes:

[1] For more details explaining why neural correlates, complexity, etc, are not important aspects when considering the hard problem see the conversation corresponding to this essay at http://uvsm.com/hard_problem_1.htm (Jan 21, 2017).

[2] Measures of mass and geometry can be reduced to ideas of information flow. Theories of physics, interactions, can be described in terms of signaling concepts, or conversely, can be defined as a means for considering what is meant by 'available information', where the notion of 'lawfulness' is regarded as being 'access limits' in those flows, as defined for any given observer. The geometric area of any surface must be reducible, in a fundamental theory, to a measure of the capacity of that surface to act as a channel of flow of information from its causal past to its causal future. This notion of 'channel of flow' corresponds to the notion of 'immanent interaction'.

[3] The notion of a 'state of the universe' is a direct connection to the theory of cosmology, insofar as there is assumed to be a 'configuration space' for the entire universe. A relevant summary of this and other "challenges to the arguments for the elimination of time", can be found at https://arxiv.org/pdf/gr-qc/0104097.pdf (Lee Smolin, Aug 30, 2000). There are a number of correspondences therein to the present work.

The considerations and questions regarding 'novelty' in the form of possible chaotic orbits in GR, three body collisions, and other forms of microstate amplification, etc, correspond to the notion of the reality of 'hard randomness' as used in this paper, in referring to, for example, spontaneous particle and isotope decay events, such as that described in the Schrodinger Cat scenario.

As such, an explicit distinction between a theory of cosmology (as an ontology of the whole) and a theory of physics (as observer local regularities in causality) is therefore important. The need for this distinction is consistent with the mathematics Godel Theorem, as connected to the Bell Theorem, as generalized in the ICT (See http://uvsm.com/ict_dialog_3.htm (Jan 21, 2017) for these developments). In effect, there is a direct binding of 'random', 'personal', and 'temporal', as concepts which are distinct, inseparable, and non-interchangeable, in the sense of Axiom III, as used in http://uvsm.com/axiom_1.htm (Jan 1, 2017).

[4] There are deep connections between the nature of 1st person time, randomness, and choice. Basically, the unicity and localization of the 'present' as a distinct 1st person moment, not modeled within a 3rd person perspective, is explicitly due to the occurrence of 'hard randomness', ie, phenomena at the basis of reality which are inherently unpredictable on the basis of any theory and/or model. Therefore, establishing that hard randomness is 'real' at any scale, and that moreover that it is 'real' at the scales at which the 1st person perspective operates, is sufficient to establish that 'time' is also real.

For additional separate arguments regarding the practical necessary of 'hard randomness' in mathematical modeling, consider the use of Zero Knowledge Proofs as a method of distinguishing 'real reality' from various methods of 'universe simulation' in http://uvsm.com/zkp_collect_5.htm (Feb 29, 2017).

[5] For more about how/why it is necessary and reasonable to consider the concept/theory of causality as fully distinct than theory of determinism, see these notes on Non Polarization at http://uvsm.com/non_polarization_1.htm (Jan 21, 2017).

[6] A copy of the "The Strong Free Will Theorem", by John Conway and Simon Kochen (Feb 2009), can be found at ams.org http://www.ams.org/notices/200902 /rtx090200226p.pdf and/alternately Arxiv https://arxiv.org /abs/0807.3286
For a summary, review the notes provided at Wikipedia https://en.wikipedia.org/wiki/Free_will_theorem and The Information Philosopher http://www.informationphilosopher.com/freedom /free_will_theorem.html (Mar 1, 2017).

[7] Ie, that particle entropy would have to be defined in terms of hidden variables. The entire point of the Conway and Kochen paper was to show that the notion of hidden variables in particle states is inconsistent with the actual results of actual experiments, *unless* assuming further that the definite chaotic state of the observer was fully corresponded, in detail, with the actual specific (presumed) definite internal state, in complete detail, with that specific particle.

If we are that committed to an effort to avoid randomness at a particle level, then we would also have to accept that the mind of the experimenter and the 'mind' of the particle were somehow directly corresponded to one another, so as to obtain the result that both were mutually fully deterministic, even though operating at vastly different scales and within completely different contextual situations.

Insofar as we can likely assume that most reasonable rational physicists would eschew such 'psychic' connections, we can therefore also regard it as given that the allowance of a notion of 'entropic randomness' on the part of the experimenter would also require a notion of 'state in-determinism' on the part of particles, if the theory of QM was also to be accepted, as 'ultimately descriptive' of 3rd person reality (ie, best possible tool available, etc).

Note; All URL have been re-verified on March 1st, 2017.

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