

## RECONSTRUCTING THE TOWER OF BABEL: MIND AND WORLD, CONSCIOUSNESS AND EXPERIENCE<sup>1</sup>

Sean O Nuallain, founder and CEO FOM and UOI

EXTENDED ABSTRACT: This paper seeks an exit from the miasma enveloping science of the subjective. First, it unpacks the various meanings of the word “consciousness”. It agrees with contemporary literature that attention admits of two modes; involuntary attention and voluntary attention. It goes on to argue that the former is best modeled by “interrupts” in computer operating systems and often reflect “chunked” learned skill behaviour. Voluntary attention, on the other hand, always reflects a processing thread globally broadcast through the nervous system and is thus inevitably conscious.

It is this process of selecting something to observe and moving back and forth from superposition (see my 2013 paper) that AI systems cannot yet come close to mastering; from it emerge not only humans’ trans-Turing computational capacities but very possibly the furthest reaches of human creativity, exemplified by the reveries of geniuses like Mozart and Einstein. In particular, it is arguable that the strong AI positions gained traction only because of the attenuation of psychology’s domain from the mid 19<sup>th</sup> century.

To clear the ground, several distinctions should be made. In terms of epistemological domain, humans function at sensorimotor, cognitive and noetic levels. The last, a distinction we adapt from Aristotle, occurs when “the unreasonable effectiveness of math” gives us insight into a level of reality that our evolutionary heritage should not allow.

<sup>1</sup> Editor’s note: *Foundations of Mind*, the independent research group that has provided the papers for this special edition, has never taken either corporate or state money and is financed entirely by donations.

Authors keep copyright without paying. The typical fee for this charged by open-access journals such as those published by PLOS, is around \$2k. If you value this project, and wish to see further such proceedings from this group, we ask you to consider donating to *Foundations of Mind* – as little as \$5 per download, through their website: <http://www.foundationsofmind.org/donate> . This will ensure there will be further published proceedings on the foundations of mind like this one for you and others to enjoy free.

[www.bionoetics.org](http://www.bionoetics.org) 276

SEAN O NUALLAIN 277

Secondly, the term “noumenal” is adapted to refer to instances in which the subject, trying to get a veridical purchase on a situation, considers itself as an object. So we can move from egocentric/coupled sensorimotion to allocentric/decoupled such. The Roomba vacuum needs only coupled knowledge; if I’m here, I do this. Allocentric knowledge is a representation of the room. In a final wrinkle, we term “relativistic” the attested phenomenon of egocentric sensorimotion in an allocentric context. This is an artifact of intentionality.

That analysis extends also to cognition and noesis. The former was best characterized by Piaget as the result of internalization of processes that originally occurred midway between subject and world. For him, the royal road to epistemology was study of the development of children’s minds – another sense of the “foundations of mind”.

Normative ie necessary facts about knowledge could be elicited from the contingent facts of its development. Moreover, the necessity of logic itself derived from universal restrictions on physical interaction with the world. The project reached its limits not just empirically, with many results being unrepeated, but epistemologically as we seem to know a lot more than Piaget’s “Naïve physics” warrants (see my 2003 book).

“Naïve physics” which does not use *pi*, *i*, *e* and other “Platonic” entities is a cognitive undertaking. And so Archimedes in his bath has a noumenal moment of subject/object differentiation. Rather famously, Einstein extended this analysis, using only cognitive concepts/naïve physics, to argue that physics required that space and time had to be “relative” to the observer – paradoxically in order to maintain the universality of physical law.

Quantum mechanics (QM) is a fortiori noetic; indeed, it is a moot point whether reality at this level is cognitively penetrable. What is not controversial is Von Neumann’s attested proof that the boundary of subject and object in QM is moveable. Much work was done by researchers like Stapp to ensure Von Neumann’s breakthrough is compatible with special relativity.

Yet that is not the full story. Quantum observation seems to change the external world; indeed, Stapp follows Dirac in arguing that the wave function of the universe changes during observation. Moreover, unless one (like Milne and Stapp) argues for two kinds of time, the observer can also change the past. The act of observation seems to be more akin to incantation/invocation in ancient religions.

That is clearly disturbing. Yet “the unreasonable effectiveness of math” has led to this conclusion.

Math is capable of the most elliptical and veridical description of reality that can reliably be communicated. In short, we are doing something in QM that possibly is part of humanity's heritage, even for the 99.9999..% of humanity which never knew QM.

This type of capacity has famously been claimed by Shamans and often has been rolled into a totalizing theocratic ordering of society that should be resisted by every rational person. The response from fundamentalists is twofold. For their base, they insist on incessant repetitions of prayers of incantation and invocation. These often remind God that he is omnipotent and should do something about the situation. If it doesn't work, the prayer has been insincere and should....well, it should be repeated more sincerely.

The fundamentalists take a different strategy in their debate with the forces of "reason". They

#### BIONOETICS 278

argue that, on an individual level, "reason" has led only to moral and epistemological relativism. On a social level, the extension of "rights" can only go so far until the facts of biology create the kind of backlash that allowed an opportunist like Trump become President.

It is at this point that we will introduce "consciousness". Obviously, if everything is relative to "consciousness", the only reality, it contains the only value. However, if we grain our epistemology more finely, we find that there indeed are processes that are relative to individual "consciousness" which has a sampling speed of about 0.1 sec, and others that are biological, occurring indeed in the picoseconds, or transcendent to "consciousness" in that they exemplify forces that in exigent fashion integrate us into the social group,

The history of psychology, and of the public university, constrains the response to this in interesting ways. Arguably, academic psychologists are the people least qualified to tackle the issue of exigent forces as their entire career has been based on a notion of mind which accepts only externals that are relative to consciousness. Conversely, to accept the social forces – which today includes a surveillance state fully as pervasive as a theocracy – into the mix is to take a perhaps unwelcome step into the real world.

This final point will delineate that step. The activists who today take part in rallies knowing that their texts to each other are being swept up by the police are themselves involved in delineating the boundary of subject and object. For example, "Occupy" activists recently had perhaps a rather Lakoff/maternal view of the state shaken by the knowledge that a la Cointelpro, the state was bugging them. Of course, their erstwhile pre-FBI state was described by Marx as false "Bewusstsein", false consciousness. Their passage into the real world no doubt has birthed many support groups who know that something sacred needs to be preserved,

As indeed, in the individual case, is the sensorimotor passage from being blocked to flow, and the individual's passage from intersubjective to authentic. None of these processes is the focus of academic psychology. They may, however, form the basis for religious practices that yearn for the

betterment of humanity, rather than the retrenchment of a Neolithic worldview. Ironically, the facts of QM are on the side of the activists, self-authenticators, artists, and dancers. What we so far lack are authentic spiritual leaders, and we discuss below what they might do if extant.

KEYWORDS: Sensorimotor; Cognitive and noetic; Noumenal; Coupled; Intentional and “determinative”

## INTRODUCTION (OR EVEN MORE EXTENDED ABSTRACT) ; WHAT A REAL THEORY OF CONSCIOUSNESS, QUANTUM OBSERVATION, AWARENESS, AND ATTENTION MAY LOOK LIKE

The word “consciousness” is, in the opinion of this writer, being asked to do far too much. Among other tasks it is asked to complete are the following;

- Tell us something about who we are, particularly in essence and apart from the ebb and flow of thoughts and sensations we continually experience ;

SEAN O NUALLAIN 279

- Provide a super Turing machine computational facility; - Bind together sensations, perceptions and thoughts; - Gain us access to a noumenal quantum reality, one redolent of a life outside

the illusions of a Platonic troglodyte; - Unify us with a Cosmic self which is also ultimate reality; - Reflect relationships in the means of economic production a la Marxist theory; A first task of this paper is to unravel this entanglement. In particular, a distinction is made between consciousness, awareness, and attention. The latter concept encompasses observation a la QM; that may not necessarily be conscious. In fact, given the femtosecond timescales involved in QM observation, we should perhaps humbly accept that there is present a type of process as yet unknown to psychology. Alternatively put, observation may like Wigner’s “unreasonable effectiveness of math” be an occasional gift we receive that allows state-vector reduction, free will (with perhaps healing) and apparent retrocausality. All leading QM and post QM theories are clear that there is something afoot that transcends Turing computability.

A way forward might also distinguish human mentation at the sensorimotor, cognitive and “noetic” levels. The latter refers to truths to which we seem to have access though Eugene Wigner’s “unreasonable effectiveness of math”. Wigner did not try and explain how this happened, regarding it as a gift we did not deserve. The accuracy in QM is roughly a few parts in a trillion; its time scales are in ratio to normal phenomenal awareness of approximately 1 second to a million years. While phenomena like the Quantum Zeno effect help bridge this gap, it is perhaps wise to consider that there may be two different phenomena at work perhaps in complement to each other.

The consciousness community has split between those studying consciousness from a cognitive science perspective and those bringing the tools of quantum mechanics (QM) to bear. The former group points out that consciousness must have something to do with experience and thus psychology; consequently, it attracts to itself practitioners of spiritual disciplines. The latter QM group points out that consciousness as related to the observer in physics seems to have emerged naturally as a topic in the development of physics, and that theirs is the most successful science of all time in terms of the accuracy of its predictions.

Synthesis between these approaches, if possible, would be very helpful. The alternative is chaos as physicists go it alone using their language which is mysterious to outsiders, and cognitivists argue that riding roughshod over thousands of years of philosophy will end in tears. In reply, the physicists might feel empowered to point out that practice often overtakes theory in science.

This debate shows a remarkable amount of professional discourtesy Physicists keep

#### BIONOETICS 280

ignoring cognitive science arguing that theirs is the basic discipline. The current generation of AI systems is working well when they conform to good cognitive science principles (SIRI, Roomba) and fail when they don't (MT in a language without much data). Secondly, intentionality must cater for the whole gamut from sensorimotor behaviour to the explicit representations of Hilbert spaces in QM. Anything else is primitive.

Two roads to synthesis look promising. One is the further use of information as the unifying principle par excellence of the past generation in science. If we add a subjective aspect to information, surely that "dual aspect" idea will bring us forward? Another, perhaps complementary, path is the use of dynamical systems approaches to neuroscience which allows awareness to be defined in terms of phase synchrony in the rhythms of the brain like gamma, and content to be construed as frequency/phase/amplitude modulation of this carrier wave.

Information is protean at this point; in addition to classical/Shannon information, quantum information has become a player. Moreover, cognitivists would argue that the sense of self that informational theories try and handle is socially and historically determined to a large extent and indeed children must learn to be certain types of selves. Put crudely, a description with its rather coarse grain of how human rights were developed in western societies will tell us more about ourselves than informational accounts with their far finer grain.

Physicists might reply that subjectivity has naturally entered through Von Neumann's analysis of the "ego" in his foundations of QM. Alternatively put, to argue that our sense of self is partly an artifact of Lorenzian relativity due to neural impulse propagation at about 3 m/s is a more elliptical way of delineating a core of subjectivity than binary codes however fine their grain.

Moreover, Diracian "Nature's choice" makes our decisions relate to the evolution of the wave function of the universe. Our action becomes voluntary and meaningful to the remarkable extent that it disturbs the whole universe.

This writer wishes to preserve the historicity of self, the subjectivity inculcated by relativity, and Von Neumann's observer, which can be co-extensive with the observing apparatus, or a disincarnate observing entity. Here is the first step; only computational and intentional entities capable of autonomous action with a formal power  $\geq$  standard arithmetic have observer status in QM. So Schrodinger's cat could not cause state-vector reduction by merely looking.

Secondly, this writer takes the "phase synchrony" account as basically correct. In this scenario, probability distributions are generated in the cortex several times a

SEAN O NUALLAIN 281

second. They vanish through the effect a neurodynamics "shutter". When they so do, there is a "zero power" interval in the cortex in which coherent quantum states can flourish, and perform the non-computational tasks which we increasingly credit human consciousness with. We thus disturb the universe a few times a second; indeed we may leave a holographic record with the object of cognition represented at different levels of granularity with differing signal/noise ratios.

To finish, and perhaps most controversially, I wish to point out that consciousness studies, despite (or indeed because of) its paucity of real results, is in danger of undertaking the same academic imperialism as early "scientific" psychology. Just as science is ultimately processed by a psyche, so is most of it presented to consciousness. This will never do; our roots in physics and math should strengthen our desideratum for normative accounts in the social sciences.

From Von Neumann we get a distinction between subject and object that is no longer fixed, but malleable, with the location of the "Heisenberg cut" being mobile. This I call "noumenal" mentation as it is this above all that allows us access to "Dingen an sich". Moreover, this "noumenal" mentation applies also to initiation into a social group where the boundaries of subject and object are being demonstrated to the neophyte – most crudely by a street gang beating him up prior to acceptance. It is here perhaps that the sacred might enter our now elaborated study of consciousness.

Finally, the primary definition of “intentionality” is that it is a process in which structures within the organism “intend” i.e. reach out to entities in the environment. At a primitive level, the prokaryote chemistry will covary with that of the environment. We include neither this nor tropisms in our inventory of intentional systems; they include only processes in which neurodynamical entities far from equilibrium are stabilized by something in the environment.

At an intermediate, “sensorimotor” level, the infant will construe his environment in terms of a set of possible operations he can perform on it in “coupled” mentation. The Roomba vacuum simulates this with embedded FSA’s or Neural nets. The argument here is that QM requires “decoupled” mentation i.e. mentation that involves a full representational system with a power  $\geq$  standard arithmetic. Only then does Gödel incompleteness become relevant.

We need to add the fact that humans are the first organisms in which signaling systems like birdsong “language” becomes united with intentional thought. Before humans, arbitrary coding is as old as tRNA but was not used for intentional systems. Consciousness studies has, in the absence of this argument, fallen prey to conscious thermostats and super Turing paramecia. Indeed, it is arguably Consciousness itself that provides a high-dimensionality rubric in which this synthesis can be executed.

#### BIONOETICS 282

The new Babel in consciousness studies has allowed amateur hour to become 24/7. The fact that we have hard-won political freedoms in the West has made many confuse their (contingent) individual autonomy for a (necessary) scientific fact to be explained. Of course, they argue, a real science of consciousness should explain how I feel right now!

And so on. Making matters worse, different disciplines have their own truth-claims and other predilections. As things stand, physicists point out that theirs is the most precise discipline. Their theories get ever more baroque. Philosophers of mind wisely shake their heads and point to category errors as well as in-principle arguments the physicists don’t get. Cognitive scientists adduce experimental findings from studies mainly on kids and undergrads and plead for their empirical pre-eminence. Neuroscientists have really very little to show, except an eschatological hope that everything will be explained as neural spikes – if only they could get *C. elegans* to spike (see Freeman, 2014, for a trenchant analysis of the limitations of current neuroscience, including the extravagantly funded projects in the EU, USA and Asia)

Let us try a few distinctions. Awakeness is what happens to most of us every morning, including those considered “vegetative” like Karen Ann Quinlan. It can be observed by changes in the brain stem. Awareness is the context in which we have our conscious lives;

it can be measured, in this writer's favored theory, by measuring synchrony and amplitude of gamma waves. Famously, Buddhist monks in meditation show high awareness by these criteria.

Yet that is not consciousness (con- scio), knowing things in relation to each other, which requires content. Much of this content is intentional ie it manifests "pointing out" something in the external world. Modulation of the carrier gamma creates content. This will eventually destroy synchrony and any conscious state with specific intentional content typically disappears in a matter of under 10 seconds, and usually far less.

One way to avoid this is to restrict content in places that specialize in this like monasteries, and call the extended state "meditation". It does seem plausible that this state allows quantum coherence to persist and that may in fact be the real relation between consciousness and super-computational process as the subject gets access to a Noosphere if given sufficient support by his community as both Einstein and Mozart were at various stages. As soon as Dirac left the groves of Oxbridge, his productivity plummeted. Mozart, who insisted on striking out on his own independently of patronage, died in a pauper's grave. Many 21<sup>st</sup> century academics, while at a lower level than these greats, would not fare well in the real world.

Attention, by contrast, has specific functions in motor control and is essential for

SEAN O NUALLAIN 283

functioning in the real world. It has two modes; voluntary and involuntary. The former shows decrease in response variability, necessary for precision, and decorrelation of information fluctuations, which facilitates in the suppression of alternative cortical threads not so decorrelated. Voluntary attention is by necessity conscious, as there is a conscious agent involved.

Involuntary attention, as we shall see, works by negative feedback or "interrupts" No such interrupts occur in fringe conscious states like day-dreaming, where the associations are uncontrolled and it can be said these states manifest inattention. Conversely, Hamlet is a very conscious, highly verbal and introspective character whose attention is elsewhere. "Something is rotten in the state of Denmark" and only allowing Fortinbras to take control will usher out the *ancien regime* that, like it or not, he knows he is part of. This is remarkably modern; politicians today often create fake Twitter storms in order to increase the gain on irrelevancies, the better to stop people talking about what the regime is and what it is really trying to do.

What makes matters worse is our tendency to identify whatever is the content of consciousness as central to the self. Plato's republic sketches an even more pathological situation; our organism is a ship whose captain is absent and the wheel is successively taken by random members of the crew, each drunk and claiming to be the master.



Identification of this pathology is the beginning of the Gurdjieff work which insists that the only free thing about us is the fact we can realize we are automatic. On the other hand, many pursue apparently successful lives while in the grip of this supposed illusion. Conversely, many of us sympathetic to Gurdjieff's critique would respond that it is only personal tragedy that opened us to it, and that the problems of life like illness and making a living still remain.

This writer believes that indeed there are different categories of mind/world interaction, starting with coupled and intentional and introducing a "determinative" aspect. Orthogonally, in terms of content, we have the cognitive, exemplified by Piaget's heroic failure, but also the noetic. The noetic manifests with the "unreasonable effectiveness" of symbolic systems (see below), perhaps gleaned from the Noosphere.

However we get these Platonic concepts, that have an elaborated semantics (not just math); the noumenal exemplifies ambiguity between subject and object, either Von Neumann "classical" quantum mechanics or (arguably) theater of the absurd a la Sam Beckett and indeed Steve Jobs' "reality distortion field". As we distance ourselves from the cognitive, we paradoxically get more precision in the noetic, and ultimately a few parts (perhaps up to 100) in a trillion in noumenal mentation in the noetic realm.

Any new theory will have to address all these issues. These orthogonal categories; the coupled, intentional and "determinative" on the one hand and sensorimotor,

#### BIONOETICS 284

cognitive, and noetic on the other is how I construe the whole of mind/world interaction from sensorimotor behaviour to observation in QM. The noumenal is a third dimension.

Strangely, as we've seen, attenuating the role of consciousness helps a lot. It is attention, not consciousness, that transforms a quantum superposition into a mixture and gets rid of quantum entanglements; it is also attention that decorrelates information fluctuations in the perceptual stream when the discourse has changed to classical, not quantum physics.

Awareness, on the other hand, is arguably merely a broadcast artifact; global workspace theories were based essentially on computational architectures like Hearsay. So why are people so interested in consciousness? Essentially, because it promises to tell us something about what we are.

Moreover, it promises to do so in the context of a theory of the cosmos and/or a grand unified theory uniting general relativity with quantum mechanics. There is even in existence a generously-funded quantum gravity center whose program argues that proper attention to a particular Lie group will reveal all. The point of view here is that is impossible. Any such theory will be a "third person", alienated description of physical reality Alternative

approaches – which all may or may not be formally equivalent, as nobody can currently say – adapt the Bohmian “pilot wave” to transform it into a qubit field and postulate a “back reaction” from biological systems redolent of how a massive object causes space-time to curve in GR. This is an improvement; it allows free human action, as does the Von Neumann/Stapp initiative that starts from treatment of a math formalism and generates matter from mind. In fact, we might well insist that our theory allows human action, and is consistent both with best practice in the physical sciences and with a social science not founded on a dogmatic relativism.

If AI systems are said to become “conscious” by passing arbitrary “Turing tests”, the problem remains that this consciousness is not what we are. We are fundamentally an urge toward Being. Put in an evolutionary context, this resolves to something like Hegel’s remark “Der Mensch ist anerkennen”. We are vehicles for nature to know itself. That is primarily a process of will and secondly one of representation; in noumenal cognition, we find conscious attention – an exemplification of will and a remote achievement – to be the causative factor. So quantum computing systems will become more efficient in gleaning information from superpositions, while unable to initiate the process of attention that is the province of Life itself as will.

SEAN O NUALLAIN 285

## INTERRUPTS AND SCHEDULING

Attention can be automatic and “driverless cars” have exemplified how automatic this driving always was. Yet “driverless cars” cannot yet collect you at address A and leave you at address B. It seems something else is involved.

Attention need not be conscious and there can be myriad threads working in parallel. This is similar to computer operating systems (OS) where threads lie dormant until an interrupt evokes them. In a gear shift car, this would involve monitoring revs until gears must be changed. An experienced driver can do this and still give conscious attention to a conversation.

Then he heads into traffic and tells his passenger to be quiet for a bit, as the driving now needs conscious attention. Famously, talking on a hand held cellphone while driving causes very many accidents.

Interrupt handling is complemented in OS with scheduling of processes. This does not always work and deadlock is possible. Somehow the brain seems to circumvent this, except perhaps in stress-induced seizure (as the author has experienced). The choice of what is salient in the conversion of a superposition into a mixture and the judicious imposition of a modulation on the carrier wave characterizing consciousness, an imposition which forms the content of consciousness, are possible non-Turing computational processes.

Of course, having an assailant run at you with a knife provides a very Turing computational interrupt with the same result and indeed many report periods of higher presence in moments of shock, but we can leave these matters until another day.

Attention's role in determining salience is the non-computational aspect of mentation at the classical and quantum levels. Moreover, it may be the case that quantum biology phenomena like quantum tunneling are how we get control of our metabolism and this too is a remote destiny.

## MIND AND WORLD REPRISÉ; FROM THE ROOMBA VACUUM TO QUANTUM MECHANICS

The relation between mind and world, termed “the problem of objectivity” by AJ Ayer, subsumes many epistemological and - embedded therein - semiotic problems. This section addresses it under the following rubrics, *inter alia*;

- Semantics and reference. While the later Wittgenstein's skepticism about the existence of a formalism encompassing enough to map all of language yet fine-grained enough to be computationally useful has proved correct, we now know a little more. “Semantic” formalisms in math like the Hamiltonian give precise enough predictions that the phrase “the

### BIONOETICS 286

unreasonable effectiveness of math” became current; Quantum mechanics (QM) displayed direct and perplexing mind and world connections; - The paradox that as math formalisms diverged from the “naïve physics” described in the experiments of cognitive scientists like Piaget, they became more precise. The most accurate observations in the scientific canon are from QM, a field that does not seem to be cognitively penetrable. Moreover, the topic is vast enough that several approaches can usefully be juxtaposed. We shall contrast psychological from math approaches, characterizing the former as the assertion of a language close to folk psychology intuitions of mind with its vocabulary of intention, will, and so on with math, here defined as the most elliptical and veridical language to describe reality that can reliably be communicated. We shall investigate the languages of the brain, and attempt to find the right level of abstraction for bare intentionality and other mind-world relations. Most centrally, we have examined the metaphysics of subject and object and derived a new vocabulary for its expression across various domains. Finally, human symbolic behaviour will be treated as *sui generis*, the advent in nature of symbolic behaviour that is also intentional.

We'd better start as we've a lot to get through! Frege hated his contemporary new science of psychology, apparently for personal reasons; his assault on its citadel unleashed the

epithet “psychologism” which we will adapt to describe “explanations” in “psychological” ie introspectively plausible terms like desire, intent etc that are formally inadequate for the task in hand. A good recent example is the mapping of such “psychological” terms in fmri and the projection onto specific brain areas of “envy” and so on. As Frege might have pointed out, fmri is a scalar description and we know for sure that the brain works with vectors and higher-order tensors. Therefore, even had the fmri research been without scientific stain – and Ed Vul and others proved otherwise – it would still have been formally inadequate.

Math, by contrast, is scientifically credible. Indeed, there is a burgeoning community of QM scholars who describe mind in math terms, using as mentalese adjuncts only the necessary vocabulary of observation in QM.

In natural language, we have syntax, semantics, pragmatics etc. Math is less complex; it is syntactically unambiguous. Applied math is denotational/ referential semantics. Sometimes the denotation is accurate, sometimes it isn't. We know to our literal cost that in 1997 LTCM crashed the Asian “tiger” economies with a childish belief in the Fourier's application to economics. Arguably the 2008 crash had a similar basis in AAA ratings given the bad loans on the basis of a math model.

So arguably the best distinction for Applied math is between fixed and arbitrary

SEAN O NUALLAIN 287

denotation. Einstein's GR, harmonic oscillator equations, etc are the former. Arbitrary denotation would include choosing a Hamiltonian for a system or co-ordinates as in “the Lagrangian”;

Compare (from Wikipedia);

“First, a (potentially complicated) Hamiltonian is found whose ground state describes the solution to the problem of interest. Next, a system with a simple Hamiltonian is prepared and initialized to the ground state.”

And

“Generalized coordinates can be chosen by convenience, to exploit symmetries in the system or the geometry of the constraints, which may simplify solving for the motion of the system.”

Now for the “languages of the brain”. Students are still taught about neural firing using the type of simple arithmetic that would embarrass a bright kindergarten, It is now known that the timing as well as the magnitude of neural afferents are critical. In fact, to model the process correctly, we need to use the vocabulary of chaoplexity.

Specifically, intentionality comes into existence when a neurodynamical system is stabilized only by an entity in the external environment. That distinguishes this ancient biological process from antecedents like tropisms or indeed simple chemical covariance with their milieu by prokaryotes.

So what distinguishes human mentation from that of other animals? Arguably, it is the fact that thought becomes symbolic, and symbols (more correctly, perhaps, “signs”) become intentional. To extend, it is possibly an intentional recapitulation of the evolutionarily process, one biologists are only now beginning to acknowledge, of interaction between the “operational” processes of the cell and “symbolic” functions of the nucleotides like rna and dna.

Partly as a result, natural language (NL) is syntactically and semantically ambiguous. It admits of myriad “language games”. If the domain is restricted (here, to the physical) and the context/language-game to a laborer conveying slabs, then denotation is simple. If neither context nor domain is restricted, NL is not formally tractable. Arguably, that is one of the points of the theater of the absurd where uncontextual and repetitive action and speech abound .

Math, by contrast, is syntactically unambiguous. As Gödel demonstrated, truth cannot be syntactically established. Applied math, as is repeatedly stated here, can be fixedly or flexibly referential. With QM, our physical intuitions come unstuck; the language game is “fragen”, questioning, but the a priori probabilities are unknown. In

#### BIONOETICS 288

the terms of behavioral economics, roughly speaking, this is “uncertainty” as exposed to “risk” where the a priori probabilities are known only in the latter case.

Of course, everyone knows – or claims to know – that once the wave function has collapsed, ordinary classical physics and cognitive intuitions return. A problem; many QM alternatives do not allow this collapse. Yet that problem is shared with NL processing. So how does SIRI and its peers work?

Essentially, the general problem of NL is unsolvable due to a limitation variously labeled the “frame problem” or “combinatorial explosion”. Humans get around this by lining up hypotheses about what will happen next and so constraining the search space. While this approach is being introduced in computer NL, it has far to go. Indeed, we can be sure that research into semantics, whether considered as “mentalese” or in more formal terms, will continue to empty the scientific budgets of many states.

What works best for Q+A systems is the phenomenon of sublanguage, a restriction of context. Here, the problem of selection begins to fall under the rubric of syntax.

## CONSCIOUSNESS; AWARENESS; ATTENTION; WILL REPRISE

Awareness is global broadcast. Pure awareness does not have intentional objects. A good meditation teacher will notice when you are slipping into subject/object duality and help reinstate uroboros. It is interesting to note that in the Bohm/Sarfati model the global pilot wave is essentially uroboros, subject/object undifferentiation until “written on” by information emanating from a subject at which stage qualia emerge. The universe knowing itself as Hegel proposed....it is very possible that a narrative similar to this will eventually prevail.

When the aware state is modulated in a way that preserves the essential coherence – if only for a few seconds – that modulation becomes the contents of consciousness

Attention involves refining a particular neurocognitive processing thread, and suppressing other such threads while suppressing response variability.

Will can direct conscious attention by turning automatic attention into voluntary attention and the neurocognitive processing thread in attention then automatically becomes conscious. Most human spiritual methods are about how to do this in a way that does not over-strain or injure the person. It seems to help greatly to spend an appreciable amount of each day in meditation and indeed to regard this time as sacred. Intriguingly attention decorrelates informational fluctuations in classical perception, rather akin to what Von Neumann’s process 1 does in quantum mechanics. Are they aspects of the same thing, the will for reality to know itself?

SEAN O NUALLAIN 289

Attention is what an autistic savant has. It can be replicated by AI systems, so limited by the frame problem of relevance that they indeed play a brilliant chess move in a burning house. Attention aided by consciousness refines the objects worked on. They can be transformed so that an attentive subject catches himself in the act of experiencing them and this stasis, described by Joyce and Schopenhauer, is the essence of great art. The alternative is an infantile Mozart pumping out divertimenti that, whatever their brilliance, connoisseurs cannot listen to, preferring the Mozart of the terrible later years.

## OUTSIDE THE ACADEMY; DIE WILLE , ONTOLOGY AND RELIGION

Ontology has been disregarded by modern science; or, rather, modern science has restricted discourse to parts of Being that can be mapped with efficient causality. That works only for the part of Nature represented in classical physics; it does not work in

quantum physics, and it is increasingly clear that even biology needs formal causality and teleology.

Biology is the entry of “Die Wille” into the cosmos, unless one wishes to recruit quantum decoherence as cosmic self-expression as the entry. It is at least arguable that biologists’ trouble with dealing with metabolic syndrome is the result of a category error as they attempt an ever more reductionist and sanitized account. Conversely, psychology has failed to grapple with the normative, let alone the transcendent, in any coherent way, leading to a stifling relativism.

It is clearly absurd (indeed, beyond Maoist) to try and replace any attested science with ill-defined impulses toward Being. Yet it does seem to be the case that human metabolism admits of a community of practice (personal trainers) who, in their bullying way, know something about elevating metabolic function of which science is ignorant. Likewise, while cultivation of awareness is handled in meditation training, practices like Zen also cultivate attention ie “one pointedness”, again famously with some bullying!. It is probably unwise, and indeed illegal to go further with these techniques than the gym and the monastery.

What can be done? In the first place, we can forget about the Abrahamic religions as a guide, for obvious reasons. The Abrahamic God is above all tribal, a fact seized on brilliantly by Mohammed to create the most successful religion in history; under Moses Yahweh became a legislator, and Islam developed Sharia. This congeries can be resolved only with fiats like the many imprecations for Him to slay enemies in the psalms, which plumb truly pornographic depths of violence in apocalyptic literature.

Religions should continue to be developed, hopefully without Jehovah. Above all, the context-dependent creation of moments in which a reality transcendent to us is

#### BIONOETICS 290

realized can most innovatively be done in the gap between subject and object; in the transition describes here as Noumenal in the cognitive realm between the intersubjective and authentic, between the subaltern and the Bewusst, between being blocked and flow as even sensorimotor prefference can enter consciousness.

When we enter the cognitive realm, we are propelled into the world of the Cartesian meditations. Descartes’ many errors included a failure to distinguish mentation that could be instrumentalized, that was “relative to consciousness” in the sense that it occurred slowly enough to become subject to voluntary action, from automatic sensory/perceptual function on the one hand exigent experiences in which self is an object on the other, and the transcendent in which a higher self emerges a la QM. It is these last two types of process that religions can most usefully exploit and explore.

The central mistake in theology is a God that is relative to consciousness, that can be instrumentalized. If such a God is also regarded as omnipotent, a cascade of imprecations to get him to solve problems is initiated. If also omnibenevolent, much of the cognitive dissonance we dignify with the term “theodicy” emerges.

Religions assert the sacred. Essentially, they consist of a set of practices to invoke the immanence of the numinous, the sacred. No longer can they have beliefs, as truth has been conceded to that aspect of instrumental consciousness known as science.

The transcendent should enter religious practice. Moreover, organic automatic functions related to food etc can and have been sacralized, a thankfulness for this anthropic universe. Likewise, the beauty and immensity of the cosmos should figure. So also should communities of practice that assert activities like ecoactivism, sophisticated art, open inquiry, currently held hostage in the academy by relativisms. These are not “beliefs” per se but one can be said to have “faith” in their importance.

Yet deep within their European tradition is clearly an echo from a time when Being and Knowing were one. In modernity, we can teach biology as a level of Being separate from inert matter; mentation as comprising the noetic and the noumenal as well as the cognitive; and invite young adults to courses of formation of themselves as people that do not involve massive student debt, or any curtailment of freedom of thought due to financial constraints and power asymmetry..

#### .OUR PROJECT

It is these issues that the foundations of mind project addresses. In three years, it has published more than 100 peer-reviewed papers which are downloaded more than 150,000 times a year. Walter Freeman, Henry Stapp, Fritjof Capra, Jacob Needleman, Menas Kafatos, and rising stars like Ed Vul and Seb Benthall have published with us;

SEAN O NUALLAIN 291

Terry Deacon, Tony Bell, Brian Josephson and many others have been active in the group. While mind in Quantum mechanics versus cognition was indeed its first leitmotif, it began to address issues being ignored elsewhere in the foundations of biology, environmental thought, and practical applications in mental illness therapy and indeed health in general.

The project started at Stanford and UC Berkeley before becoming an international franchise with 2017-2018 events in Italy, Ireland, India, and China.. It then focussed on the ontological paradigm that underlies our view of science, and the possibility for self-transcendence that differentiates us from mainstream psychology. Moreover, our treatment of social science similarly emphasizes the normative to distinguish itself from



the subjectivism, psychologism and relativism now rampant.

In neuroscience, we offer the only pedagogic treatment online of mesoscopic neurodynamics, while also asserting that the brain is at least as complex as the physics models it routinely uses - like 4<sup>th</sup> order tensors. Finally, we are using a “Freemium” model to continue online teaching in a manner that guarantees academic freedom and respect for both faculty and students, a massive reduction in fees, and innovative programs in areas like cognitive science.

Taleb (2010) brilliantly points out that the academy has always lagged far behind the cutting-edge of its contemporary thought. While his *bête noire* is the insistence on using - - roughly speaking - “normal”/ Gaussian distributions to describe processes that admit of “black swans”, a priori unlikely events, he also argues that Voltaire and others wrote outside an already well-established academic structure. Freeman (2014) echoes him on two points; yes, current academia is not studying neuroscience properly and secondly, we need non-linear models and indeed precisely the kind of fractal/chaoplectic models on which Taleb claims he made his fortune.

If we stress metabolism, will *qua* attention and ontology - or, more simply, Being itself - what is formerly an academic project begins to enter the real world. It becomes, in effect, a religion in that it stresses that the numinous can be approached through a certain subset of human activities. These in general are selflessness in social relations; not just speaking, but acting out truth to power; science which insists that there are ways of knowing not currently within the purview of the academy; arts which stress forms of expression that are more encompassing, often measurable in terms of computational stacks; physical action that manifest “flow” rather than brute power and passivity; and so on.

This paradoxically dynamic stasis permanently changes the identifications of the self. It is analogous to “seeing” the truth of a Gödel sentence. Alternatively put, Ultimate Reality now can BE through oneself in a more authentic way. As academic activity, we term the extension of the idea of knowledge as “Bionoetics” to distinguish it

#### BIONOETICS 292

from psychologism-prone cognition.

There is no claim of privileged access to “God”; indeed, atheists may be correct in their insistence that God has run his course and that the certainty formerly predicated of him should be assigned to science. Moreover, the domain of science will always expand. That leaves a noumenal realm, one in which certainty has evaporated because the person is seeking the limits of subject and object, for (post)modern religious leaders to mine. The best example that comes to mind is precisely the experience of self as object that has been in many ways the outstanding revelation of 20<sup>th</sup> century Western spirituality in dialogue with the East.

## QUANTUM MECHANICS AND SEMANTICS; OR, ON DOUBLE SLITS AND LANGUAGE-GAMES

This paper now advances four radical hypotheses. The first, already alluded to, is that physics formalisms like the Lagrangian are not “semantic” in a way analogous to language formalisms like lambda calculus, but are best described as flexibly referential. The second is that when such formalisms are denotational – that is, when they correspond to the planned suburbs of Wittgenstein’s “city of language” – the act of mind involved is better termed “noetic” than “cognitive”. The third is that such noesis is related to what symbolists like Mallarme had in mind, including current trends like semantic transcendentalism. Finally, it is suggested that QM resembles Beckett more than Mallarme, with the caveat the result is veridical rather than absurd.

So the Platonic troglodyte was initially disabused of his ignorance by modern science in the shape of Galileo, who argued two points;

- the language of nature is indeed Platonic like shapes, to which we moderns add sines, cosines, attractor surfaces and fractals; - there is a critical difference between the “primary” qualities dealt with in science like velocity, and more subjective “secondary” qualities like love. The word “Semantics” has had a chequered career and now is used for formalisms like the Lagrangian, Hamiltonian and phase diagrams in physics. Of these three, the latter is considered denotational and the others non-denotational. We can unpack this premature conclusion in the context of Wigner’s “unreasonable effectiveness” of math and the recent attempt by Sarfatti and Sutherland to adapt the Lagrangian to provide a classical, deterministic statement of Bohm’s “post Quantum mechanics”.

The second task is to reconstrue Wittgenstein’s “ordinary language” philosophy as in fact his second ascent toward the absolute. Specifically, it is argued that in the “Untersuchungen/ investigations” he inveighs against formalism and toward propositional attitudes as the means by which the microcosm that humans are access

SEAN O NUALLAIN 293

the macrocosm. As thinkers like Needleman have repeated, language-games continually refer to a self who needs to be authenticated, a spiritual path. Both the Tractatus and Untersuchungen Wittgenstein are arguably mystics, with a different central insight; one about the difference between the finger and the moon, and the other about the self.

Alternatively put, we can distinguish bare intentionality, hundreds of millions of years old; linguistic/cognitive intentionality, the synthesis of language and cognition; noesis; and what Unruh popularized as “determination”, that act of quantum observation that

determines and arguably changes reality.

#### HOW ALL THIS RELATES TO THE AI SCARE

It will almost certainly remain true that formalist approaches, be they the forerunner of GOFAI he proposes in the Tractatus or the current “deep Mind” approaches from Silicon Valley will remain toys as even 99.99% correct is wholly inadequate for real language use and this is clearly a testable hypothesis. In fact, there is a strong suspicion that denotation is better exemplified in physics than any known language semantic formalism.

The “quantum gravity” of Penrose, pilot wave of Bohm, and free choice of Stapp have been the alternatives to the strong AI of Turing machines adduced here. While they look very different, in 1926 Schrodinger proved that the apparently wildly diverse approaches of his wave mechanics and Heisenberg’s matrix mechanics were formally equivalent.

When we deal with the AI scare, we do so with an emasculated psychology. As the old joke goes, its will failed (19th century as “natural metaphysics” gave way to labs); it then lost its soul (despite Jung); Frege led the campaign for it to lose its mind; and finally, it lost consciousness, most remarkably to physicists. The response here is to re- introduce an ontological approach to nature, a great chain of being; to distinguish the noumenal and other types of mentation in the orthogonal trio of sensorimotor, cognitive and noetic; to smuggle back the will with references to metabolism and attention; and to remain open to the transcendent.

To assert the transcendent, on the other hand, is to embroil oneself in a psychic activity normally categorized as religion. Yet in power relations, the distinction between our normal subaltern selves and the “politically enlightened” intellectuals who understand social forces gives pause; emotional experience that is narcissistic versus transpersonal has ecological consequences; intersubjective automatic behaviour versus authentic such is clearly a distinction with a difference; motor behaviour in flow versus tension shows that these patterns continue as there seems indeed a critical difference

#### BIONOETICS 294

between “centered” and “alienated” function.

How does nature become and know itself through us? We may never know; yet the notion that attentional process mediated through the nuclei reticularis thalami can be voluntarily suppressed to create a superposition and then a quantum Fourier transform gives us computational powers outside the range of current computers appeals to this writer. This seems to occur only when completely relaxed, like the young Einstein in reverie daydreaming of what it was like to ride a light wave. As Kekule allegedly said after a similar alleged breakthrough, let us learn to dream.

A first distinction that is remarkably, still not being made is between consciousness itself and its contents. And so, in his recent foray into the area, Michio Kaku berates us all for publishing 20k papers without a single definition of consciousness, he then provides a definition; feedback loops between elements at three levels starting with the sensorimotor and then the social. Apart from the professional discourtesy, these areas are dealt with by “decoupled” architectures and social science (especially intersubjectivity theories), without any need to invoke consciousness. So Kaku makes it 20,001!

The Penrose/Hameroff model. On the other hand, continues to be a solution looking for a problem. There is no theory of content there; there is rather an aggressively-defended theory of how trans-Turing computability might arise from biology at levels that are still very poorly understood.

And so on, and so on. Here is the argument of this paper; there is no mystery about consciousness, which reflects dissemination and integration of information throughout the organism. For trans-Turing computability, attention and willed superposition (see my 2013 paper) is a much more likely candidate. At both the quantum and classical levels, attention chooses one processing thread from many, forcing decorrelation of threads not attended to. In both cases, there are non-attentive processes doing the same thing in nature; decoherence and ordinary neural sparsification, respectively .

Attention arises when the subject apprehends to himself this capacity for decoherence and ordinary sparsification. Perhaps indeed our feeling of attending accompanies them. Remarkably, the Fourier transform that characterizes successful quantum computing is echoed at the classical level by neurons preset to perform such transforms. Our science may be more unified than we think.

But what is the subject? In Kierkegaard's gnomic utterance, it is the very facts of an entity relating to itself. Can we do better? Perhaps. What is unique about humans is that consciousness allows a lingua franca in which symbolic and intentional coalesce; while birds sing and chimps calculate, the union of these processes is, in evolutionary

SEAN O NUALLAIN 295

terms, unique to humans. The extended neural processes then supervening intentional content is perhaps what begets our social sense of self, a sense encouraged by liberal democracy

So we create symbolic constructs that are metaphysically ambiguous, and whence subject and objects arise. Arguably, along and perhaps complemented by frames of reference in special relativity, this is the origins of the uniquely human sense of self. We do not remember ourselves all the time! The identifications of selves become automatic, the matter of interrupt handlers, and only when we have sat at a meeting for an hour do we

sometimes realize that politically the speaker violates our sense of political belonging and that we should leave.

#### INTERLUDE; THE HARD PROBLEM OF LIFE (OR HOW MANY HOLES DOES IT TAKE TO FILL THE ALBERT HALL?)

“Now, son, let me tell you what it’s like out there and what you need to do’

“OK, dad, I’m listening” Sort of.

“Well, you’ll never find a perfect existence. Entropy seems to hold in the social field as well. If you find something that gives you delight, as Richard Feynman recommended, stick with it. If you find an audience for what you do with it, and they become customers, that’s the material problem solved. The rest involves finding the right woman, friends, place to live, and a lot of that is chance and will be helped by the fact your job makes you comfortable with yourself. But I can give you guidelines and resources”

“Stop it dad! I want to solve the hard problem of life!”

Of course, the responsible father is giving advice as to how to do precisely that, but his son, in a pattern repeated since the dawn of time, will not listen. Yes, I am alluding to “The hard problem of consciousness” . Instead of a host of linking subjects like political science, kinesthetic studies, aesthetics, and indeed cognitive science (etc) we are given to believe that “solving the hard problem” is an alternative approach to Reed’s (1997) desideratum for a “science of experience”.

As currently stated, it simultaneously involves dealing with “the movie in the head” and our undoubted sense of being subjects. Yet that latter sense is often fringe consciousness, and we feel union with others in relation to them. When our money is stolen or our basic political rights violated – both artifacts of the neoliberal socio- political system – self of course goes from fringe to center of consciousness. Alternatively, in fugue and dissociative states, there may be no central self presenting itself to consciousness.

BIONOETICS 296

In any case, “self” is predominantly a socio-political achievement. Where the “hard problem” wreaks most damage is turning it into a math quiz; essentially, by asking what kind of apple is an orange. What kind of math object is your self, whose origins are best handled by social science? How many holes does it take to fill the Albert hall?

END OF INTERLUDE

In previous work, it was proposed that the origins of our sense of self in complex environments may be relativistic; the speed of neural impulse means that the frame of reference is Lorentzian (to which I might add my fellow-countryman and so “Fitzgeraldian”). This distinction between frames of reference may underlie or maintain the Ur-concept of self, as initiated by the non-deterministic process 1/Penrose’s “R”.. It is consistent with classical QM to say that the distinction presents itself to consciousness. It is consistent with psychology to say that we may identify ourselves absolutely and recursively with self’s processes of identification or step back and know ourselves as yet another signal in the buzzing confusion of our experience.

What is for sure is that such self-knowledge requires the apparatus of critical theory, a spiritual tradition, and much else. The mystery is not that we are selves; it is that we can loosen self’s identifications and know ourselves as another signal – another object – however briefly. Alternatively, when sampling from the manifold selves we are, of course as symbolic creatures we are going to experience a symbolic entity.

The issue of what constitutes observer status urgently needs to be addressed. Otherwise we end up with extravagances like conscious prokaryotes for whom  $P=NP$  (Orch OR a la Hameroff/Penrose), cats looking at the moon and turning a superposition into a mixture (Stapp/VN) , and arbitrary biological systems fomenting a “back-reaction” that is “written” onto the pilot wave of the cosmos, causing qualia (Bohm/Hiley/Sarfatti) and indeed the famous other cat - Schrodinger’s . Not unrelated; the “conscious thermostats” plaguing philosophy of AI for several generations, and recidivist in “dual aspect” theories of consciousness.

Much hinges on interpretations of Gödel. Orch OR is particularly dependent on it, consciousness supplies a “factor”  $x$  that allows one “see” the truth of the Gödel sentence. However, Penrose’s association with Hameroff means such perspicuity is extended to paramecia. For Stapp, the non-unitary function can be supplied by the infinite (personal comm..). Something needs to be done.

Let us start with the notion of intentionality, a Thomist term that Brentano reintroduced in the 19<sup>th</sup> century. Intentionality arguably begins several hundreds of millions of years ago, when creatures like the tiger salamander “intended” (reached

SEAN O NUALLAIN 297

out) into their environment to perceive discrete objects. For humans, such intentionality is mediated by symbols. Here comes the crux; we are arguably the first creatures for whom symbol systems (previously seen in birdsong etc) are mixed with intentionality and indeed “thought”.

We now can, if we wish, argue that the truth of the Gödel sentence can be limited to

intentional beings that have mastered a symbol system equivalent to first-order predicate calculus, which is incomplete a la Gödel. That restricts wave function breakdown in observing systems to humans – appropriately in this writer’s view.

Of the systems mentioned above, both the Bohm/Hiley/Sarfatti systems and the Stapp/VN system cater for meaningful human action that results in a change in the cosmos. In the case of the former, we also have a cosmic “pilot wave”, represented through fiber bundle theory, that interacts with a local such to cause qualia.

Yet that is not really the whole story. In my 2016 collection, Montemayor argues with some consistency that the conscious “now”, with a minimum timespan of 2.5 ms, is far too long for QM which operates in times less than picoseconds. Moreover, he argues that attention, rather than consciousness, should be seen as primary. Therefore the jury is out on this quote attributed to Nobel laureate Frank Wilczek about the chaos in QM theory;

“I believe it will remain so until someone constructs, within the formalism of quantum mechanics, an ‘observer,’ that is, a model entity whose states correspond to a recognizable caricature of conscious awareness.”

It has been said that Wittgenstein, long before Trump, in his engineer’s way saw his job as draining the swamp in philosophy. With different interpretations of QM superimposed on different notions of the subjective, the swamp in consciousness studies is intractable indeed. We need a new Schrödinger (1926) to show a unity where currently there is chaos, rather than mere diversity.

Let’s at least try. Shor’s algorithm is essentially classical pre-processing followed by using the quantum Fourier transform to find a period. If we (IMO correctly) view neurons as harmonic oscillators, the process of sensory transduction becomes a classical Fourier transform. Interpretations of (post) Qm that cater for human agency like Bohm/Hiley/Sarfatti and VN/Stapp have an autonomous observing subject whose action causes a change in the cosmos.

Now it is about to get even more interesting. We find that, while there is confusion about “wave-function breakdown” ie non-unitary evolution in decoherence theory, it is allowable to state that disentanglement is the hallmark of human action on a superposition. Remarkably, in the cortex, this is precisely what human attention does to classical neural firing; it decorrelated information fluctuations as my 2013 paper

shows. We can call this use of attention “will” and argue it spans both the classical and quantum realms.

Now here again is our revised vocabulary. “Awareness” can be operationally measured by phase synchrony of gamma; it does not relate to content, but is like the intensity of light in

which content is experienced. “Consciousness” (con-scio) reflects the dissemination and integration of information, and may be measured by modulations of the carrier gamma wave. “Observation” is related to attention, and is profoundly causative in the classical and quantum realms.

Our experience of subjectivity is profoundly socially-formed, It may indeed be the case that it is due to relativistic frames of reference . What is definitely true is that the self system is more like a system of interrupts than a rock of subjectivity – did you remember that you support x team or that you despise Rap as you read this? These can economically be described as the “interrupts” described above that evoke a part of your self system that was irrelevant while reading a semi-technical piece.

## EXPERIENCE REDUX

Let us then attenuate psychology from its Reedian ambitions, consciousness from its Vedantin ambitions, and - to adapt Joyce - all these big words causing so much confusion. So attenuated, they turn into valuable research projects. Let us instead home in on a new discipline of Being, one that distinguishes human action centered in an all-encompassing ground of Being from action not so centered.

If they forbid us to do it in the academy, we can call the activity of so centering ourselves a religion. The modern academy has, accidentally or not, essentially focused on burdening students with debt in micro-specialized educational programs; the USA made it illegal to run colleges that do not conform to this narrow accreditation before partly reversing this under Trump. Even in academia, on the other hand, metabolism has entered biology as causative in gene expression; there is no retreat from QM; the anthropic principle and its equivalents make the world a mass of happy coincidences; attention seems to import the Will into science as Maine de Biran and others wanted,

As religion, we do not need any personal god but should allow a marketplace of revelations. A survival of the fittest between hierophants proclaiming the glory of the world and invoking pneuma/Ruah is by no means disallowed by contemporary physics, and they should be allowed continue to compete in the battlefield of ideas with the scientists.

In academia, on the other hand, we allow the following innovations;

1. The unreasonable effectiveness of math;

SEAN O NUALLAIN 299

2. Consciousness as phase synchrony in classical terms; 3. The existence of a Noosphere allowing the existence of the Platonic Ideas that



math partly subsists on; 4. The fact that we are very sociable creatures –as Ed Hutchind pointed out radically dependent on social/cognitive artifacts - and consume “memes” including those that tell us which is our responsibility and where our precious freedom lies; 5. “Downward causation” as the capacity to put the system and apparatus back into superposition before attention decoheres it; 6. The idea that math is the most elliptical statement of the universe knowing itself through us; 7. the possibility of transpersonal experience in fields from the sensorimotor right through the social as being in some sense the ground of being knowing itself and being through us; 8. Prosaically, inheritance of constraints and models from classical physics to the biological and the neural level; 9. Additional constraints in the neural level as it attempts in a reduced stack height and modeled by co-ordinate free flows to emulate the known achievements of mind in math physics 10. The will through attention, control of metabolism etc

Specification of subjective states is not the job of a university as students are encouraged to explore a large space of possible identities available to them through postmodernity. Education of a larger space of possible emotions is nonetheless an arts and humanities duty; attunement to political realities is a liberal arts duty. To go beyond that, to experience the putative ground of being, is the task of religion.

To distinguish in mentation between the sensory, perceptual, symbolic, noetic and noumenal is a good first step. The noetic and noumenal have been elbowed out of psychology just as anything normative in the symbolic field was in the 19<sup>th</sup> century. The “science of consciousness” is making exactly the same mistakes.

We do not know what version of QM will prevail, or whether another Schrodinger (1926) will prove the unity behind the apparent diversity. What several of the versions (roughly, VN/Stapp and Bohm) seem to be converging on is a scenario where one’s noumenal/noetic activity affects the state of the universe, be that expressed as a pilot wave or quantum wave function. Moreover, there does seem to be a capacity to change local reality not just now and in a future time cone, but in the past to some extent.

All this is well beyond the current capacity of AI. Moreover, once we stop trying to

#### BIONOETICS 300

reduce reality to formally inadequate psychology, the notion that there is an encompassing reality that we explore throughout our lives becomes more salient. Such exploration was often the subject of initiation ceremonies, held in a sacred space, It may in fact be the case that such activity is noumenal, and has existed throughout history.

Let us leave the final words to Joyce from the conclusion of “The portrait of the artist as a young man” –

“Welcome, O Life! I go to encounter for the millionth time the reality of experience”

president@universityofireland.com  
universityofireland@gmail.com

## REFERENCES

- Freeman, W (2014) Review of Pribram’s “The form within” *Journal of Integrative Neuroscience*, Volume 13, Issue 02 Ó Nualláin Seán (2003) *The search for mind*, Exeter, England: intellect Ó Nualláin Seán (2013) “Neural Oscillations & Consciousness: Attention as a Litmus Test for the Quantum Mind Hypothesis” *Journal of Consciousness Exploration & Research* | July 2013 | Volume 4 | Issue 7 | pp. 697-713 Reed, E (1997) *From soul to mind*, New Haven, US: Yale UP Schrödinger, E., 1926, “On the Relation of the Heisenberg-Born-Jordan Quantum Mechanics and Mine”, *Annalen der Physik*, 79: 734–756 Taleb, N. (2010) *The Black Swan*, New York