

Quantum Sunyata, & The Real & Unreal

The Equivalence of Quantum and Sunyata Fields - A metaphysical and semi- mathematical demonstration

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J. Robert Oppenheimer, who was the scientific director of the Manhattan Project to build the atomic bomb, famous for referring to the Hindu scripture the Bhagavad-Gita: “Now I am become Death, the destroyer of worlds,” in the context of the first atomic bomb test, made the following observation when discussing the Heisenberg Uncertainty Principle:

If we ask, for instance, whether the position of the electron remains the same, we must say ‘no’; if we ask whether the electron’s position changes with time, we must say ‘no’; if we ask whether the electron is at rest, we must say ‘no’; if we ask whether it is in motion, we must say ‘no’. The Buddha has given such answers when interrogated as to the conditions of man’s self after his death; but they are not familiar answers for the tradition of seventeenth and eighteenth-century science.¹

Here Openheimer is referring to the Buddhist Sariputta-Kotthita Sutta:

Now then, friend Sariputta, does the Tathagata exist after death?

That, friend, has not been declared by the Blessed One: “The Tathagata exists after death”.

Well then, friend Sariputta, does the Tathagata not exist after death?

Friend, that too has not been declared by the Blessed One: “The Tathagata does not exist after death”.

Then does the Tathagata both exist and not exist after death?

That has not been declared by the Blessed One: “The Tathagata both exists and does not exist after death”.

Well then, does the Tathagata neither exist nor not exist after death?

That too has not been declared by the Blessed One: “The Tathagata neither exists nor does not exist after death”.

Now, friend Sariputta, when asked if the Tathagata exists after death, you say, “That has not been declared by the Blessed One: The Tathagata exists after death”. When asked if the Tathagata does not exist after death... both exists and does not exist after death ... neither exists nor does not exist after death, you say, “That too has not been declared by the Blessed One: ... Now, what is the cause, what is the reason, why that has not been declared by the Blessed One?

“The Tathagata exists after death” is immersed in form.

“The Tathagata does not exist after death” is immersed in form. “The Tathagata both exists and does not exist after death” is immersed in form. “The Tathagata neither exists nor does not exist after death” is immersed in form.

.....

This is the cause, this is the reason, why that has not been declared by the Blessed One.²

It is important to understand what this very significant passage actually means, it will be fully elucidated below. Oppenheimer did not fully understand, he only had a very superficial understanding, based on his recognition of the similarity between the quantum state of an electron and the strange formulation of the possibilities of after-death existence expressed by the Buddha.

In the above passage the Buddha indicates that the Tathagata after death neither exists, nor does not exist, nor both of these states nor neither of these states. The word ‘Tathagata’ refers to an enlightened being, not an ordinary ‘man’, as Oppenheimer thinks.

Literally, a ‘Tathagata’ is a being who has gone (*gata*) to ‘thusness’ or ‘suchness’ (*tathata*). The synonym *dharmatā*, indicating the ultimate nondual realm of enlightened awareness, is also often used in place of *tathata*. So in the above passage the formulation “neither exists, nor does not exist, nor both, nor neither,” is applied to an deep, hovering between existence and non-existence, sphere of nonduality and awareness which manifests within the mind after the activation or intervention of ‘Nirvana’, or enlightenment, in a practitioner’s mind-continuum. Furthermore, this passage clearly indicates that this nondual realm of enlightened awareness is the ‘state’ of an enlightened being after death.

In the *Udana* the Buddha expressed the realm of the unconditioned, the nondual ground from within which the illusion of the dualistic experience of the everyday world arises, in inspirational language:

There is that dimension where there is neither earth, nor water, nor fire, nor wind; neither dimension of the infinitude of space, nor dimension of the infinitude of consciousness, nor dimension of nothingness, nor dimension of neither perception nor non-perception; neither this world, nor the next world, nor sun, nor moon. And there, I say, there is neither coming, nor going, nor staying; neither passing away nor arising: unestablished, unevolving, without support. This, just this, is the end of stress.³

This state of ‘enlightenment’ is deeper, or beyond, all of the extremely refined meditation states such as the “dimension of the infinitude of space” and “dimension of neither perception nor non-perception”. Another description is :

There is, monks, an unborn, an unbecome, an unmade, unfabricated. If there were not that unborn, unbecome, unmade, unfabricated, there would not be the case that emancipation from the born, become, made, fabricated would be discerned. But precisely because there is an unborn, unbecome, unmade, unfabricated, emancipation from the born, become, made, fabricated is discerned.⁴

An intimation of the experiential nature of this realm can only be achieved to various degrees through the development of meditation techniques which enable the mind to break through the surface conceptual levels in order to focus on its own fundamental

nature. Meditation states such as the “dimension of the infinitude of space” and “dimension of neither perception nor non-perception” are stages towards this goal, usually designated ‘Nirvana’.

‘Nirvana’ literally means “quenching” or “blowing out,” in the way that the flame of a candle is blown out and extinguished. This is the cessation of continued grasping at, and maintenance of, dualistic modes of experience and states of mind. Such a ‘mind’ simply relaxes into the unconditioned realm of the universal luminous nondual empty Universal Mind-Awareness of the process of reality. All dualistic states appear as dream-like illusory appearances. In the following passage, taken from the commentary to the *Diamond Sutra* by the contemporary Chinese Buddhist teacher Hsing Yun, the dualistic appearances are compared to ‘dust’ floating within the “clarity of perfect awareness,” the term ‘*lakshana*’ indicates dualistic appearances:

Dust clouds the metaphorical pool of enlightened awareness. ... Lakshana rush into the mind and appear before it like clouds of dust-like lakshana; impure intentions are based on deluded visions of dust. Dust clouds the mind on all levels; matter is dust, illusion is dust, and thoughts and perception also are dust. Only the Tathagata sees the ‘vast realm of emptiness’ in which all of this floats in the clarity of perfect awareness.⁵

This describes how a Buddha, an enlightened Tathagata, experiences the dualistic everyday world.

This also gives a clue concerning how an enlightened being might experience death, as far as we can conceive of these processes. Although a tathagata experiences primarily from the deeper nondual sphere of luminous universal clear awareness, they will still experience the illusion-like ‘dust’ of the dualistic world appearing in a dream-like fashion. Death simply removes this ‘dust’, subsequently the empty luminous bliss realm hovering between existence and no-existence is still functional, so to speak. It is the timeless, empty, luminously-aware, ground of the process of reality. the Quantum-Sunyata Field.

In the second half of the Sariputta-Kotthita Sutta passage quoted above, the questioner asks: “what is the cause, what is the reason” that the “Blessed One” has refused to use any of the four alternatives to describe the after-death condition. And the answer is that, if one asserts any of the alternatives - exists, not-exists, both, neither - the assertion will be “immersed in” one of the five categories of dualistic experience - form, feeling, perception, fabrication and consciousness. These five categories are called the *skandhas* in Buddhism, usually translated as ‘aggregates’. They were used by the Buddha as a convenient categorization for describing the psychophysical processes of reality. ‘Form’ indicates material aspects of experience; ‘feeling’ indicates feelings of pleasant, unpleasant, or neutral; ‘perception’ indicates the mental capacity for cognition of the external and internal worlds; ‘fabrication’ is the conceptual and habitual functions of the mind; and consciousness indicates the dualistic field of consciousness underlying the cognitive functions of mind. So here the Buddha is indicating that the four possible conceptual ‘extremes’ of ‘existence’ - which are: existence, non-existence, both, or neither, only apply within the dualistic world. None of these attributions can be made to the ground state which underlies the dualistic functioning of the process of reality.

Think about this, it is an extraordinary statement. The Buddha asserted, about two thousand five hundred years ago, that the nature of ground state of the process of reality was such that none of the following statements applies to it: it exists, it does not exist, it both exists and does not exist, and, furthermore, it cannot be said that it does not both exist and not exist. This is such a bizarre claim, surely to think that it might be validated by quantum theory would suggest indulgence in New-Age illegal substances!

In the later Mahayana (‘Extensive Vehicle’) Buddhist tradition this insight became enshrined into the division into a nondual ‘ultimate’ reality and a derived ‘seeming’ or ‘conventional’ reality. And the Buddha’s insight concerning the ultimate nondual nature of the ground of the process of reality discussed above became formulated as the ultimate nature of the process of reality:

Everything is real and not real,
Both real and not real,

Neither real nor not real.

This is the Lord Buddha's teaching.⁶

As the Madhyamika Bhavaviveka indicated the character of reality is:

Neither existent, nor non-existent

Nor both existent and non-existent, nor neither.

...true reality

...is free from these four possibilities.⁷

This depiction of the four-extremes existential configuration of ultimate reality (called the *Catuṣkoṭi*) is central to Madhyamaka metaphysics:

From certain single perspectives

[The Buddha] taught them as either 'non-existent' or 'existent.'

From both perspectives,

He expressed them as 'neither existent nor non-existent.'

Since they do not exist as they appear,

He talked about their 'non-existence.'

Since they appear in such ways,

He spoke about their 'existence.'⁸

This is the existential configuration of emptiness, and this existential configuration is said within the Madhyamaka to apply to the inner nature of the material world. Madhyamika philosopher-practitioners were quite clear that they were making a metaphysical claim, i.e. a claim about what is ultimately beyond the appearance of the 'physical'. And today this has become a quantum-physical claim, that the world does not ultimately inherently and substantially exist. Its ultimate nature is that:

Neither existence nor non-existence

Nor both, nor is it not in the nature of both.

It is freedom from these four extremes

That the Madhyamika understands.

As we shall see, this conforms exactly to the existential configuration of a quantum superposition.

As we have seen, Oppenheimer noted that the quantum uncertainty principle reminded him of the after-death existential configuration described by the Buddha, which, as we have also seen, was subsequently asserted to be the ultimate existential configuration of all phenomena. This state of hovering between extremes of existence – neither existent, nor non-existent, nor both existent and non-existent, nor neither – not fully occupying any of these possibilities, is both the hallmark of the unobserved quantum realm and of emptiness.

Remarkably, we find exactly the same configuration of the possibilities of existence appearing in descriptions by quantum physicists. For instance Jeffrey Alan Barrett in his book *The Quantum Mechanics of Minds and Worlds* cites this paradoxical quantum configuration of existence:

...a neutral K meson is typically not a K^0 meson, not a $-K^0$ meson, not both and not neither.⁹

The Italian physicist Giancarlo Ghirardi, in his book *Sneaking a Look at God's Cards: Unraveling the Mysteries of Quantum Mechanics*, tells us, referring to the existential possibility configuration for a 'quantum chair' as indicated by the quantum mathematical formulism, that ($1/\sqrt{2}$ is a number such that $1/\sqrt{2}$ multiplied by itself equals $1/2$):

...according to the formulism the chair can be found ... in a state analogous to that of the photon:

$$| ? \rangle = 1/\sqrt{2} [|there\rangle + |here\rangle]^{10}$$

Which indicates that the quantum possibility of position is spread between 'here' and 'there' according to this equation. And he then comments:

What meaning can there be in a state that makes it illegitimate to think that our chair is *either* here or in some other place? ... only potentialities exist about the location of the chair, potentialities that cannot be realised, unless we carry out a measurement of position? How can it be understood that, attached to these potentialities, is a *nonepistemic* probability that in a subsequent measurement of position the chair will be found here or there (which is equivalent to asserting that, before the meas-

urement was carried out, the chair could be **neither here nor there, nor in both places, nor in neither place**)?¹¹

The italicised word ‘nonepistemic’ is emphasised (in the original text) because the situation of ‘hovering’ between possibilities of existence is not a matter of our lack of knowledge; it *is the ontological condition of the quantum entity*.

The following is from science writer Marcus Chown’s book *The Never-Ending Days of Being Dead*, which contains intriguing elucidations of cutting edge physics:

So, what of a water droplet that **hovers half in existence and half out of existence**? It goes without saying that nobody has actually seen such a schizophrenic water droplet ... Where does the quantum weirdness go.¹²

Here Chown is making the point that at the quantum level water molecules *can* hover “half in existence and half out of existence,” it is only because there are a vast number of molecules in a water droplet that this “quantum weirdness” is eradicated. Indeed, it is the capacity to hover half-in and half-out of existence that allows molecules to hold together, and this allows the entire universe to hold together. As the science writer Michio Kaku tells us:

The reason why molecules are stable and the universe does not disintegrate is that electrons can be in many places at the same time. electrons can exist in parallel states **hovering between existence and non-existence**.¹³

It is because the electrons which encircle the atomic nucleus are actually clouds of hovering potential existence, that they are capable of being in two places at once, at the same time as being one thing, thus they hold molecules together.

The reader really should get themselves a stiff drink, or a coffee, read the next paragraph, which is in bold, carefully, put the book down and ponder for a few minutes.

About two thousand years ago, Buddhist practitioner-philosophers, using everyday observation, logical analysis and meditation insights, came to their central conclusion that the everyday world did not exist as it appeared. The ultimate nature of all phenomena, they asserted, was that:

**Its character is neither existent, nor non-existent,
Nor both existent and non-existent, nor neither.
Madhyamikas should know true reality
That is free from these four possibilities.¹⁴**

Furthermore, they also asserted that this existential configuration, emptiness, the lack of inherent existence, is essential for the functioning of the process of reality and the universe:

If things were not empty of inherent existence, nothing could function ... It is their emptiness of inherent existence that allows everything to operate satisfactorily.¹⁵

Today quantum physicists have discovered that these metaphysical insights on the part of Buddhist philosophers are precisely correct (note that there is no claim that the Buddhists had discovered quantum equations, we are concerned with metaphysics). Now to repeat a previous quote, Michio Kaku tells us that:

The reason why molecules are stable and the universe does not disintegrate is that electrons can be in many places at the same time. electrons can exist in parallel states hovering between existence and non-existence.¹⁶

Which is why the Madhyamika master Nagarjuna wrote:

**For those for whom emptiness is possible,
Everything is possible,
For those for whom emptiness is not possible,
Nothing is possible.¹⁷**

However, despite such an extraordinarily precise overlapping of metaphysical insights, there are anti-quantum-mysticism activist physicists, such as Jean Bricmont, who is very, very unlikely to know an atoms worth of anything about Madhyamaka metaphysics, who will pugnaciously proclaim that:

... the relation between modern physics and ancient texts is at best at the level of analogy or metaphor. But even these analogies can be questioned in the case of Eastern mysticism and quantum mechanics.¹⁸

Such a claim on the part of Bricmont would perhaps be justified if we were talking about vague correspondences such as those made by Fritjov Capra in his *Tao of Physics*:

The most important characteristic of the Eastern world-view – one could almost say the essence of it – is an awareness of the unity and mutual interrelation of all things and events, the experience of all phenomena in the world as manifestations of a basic oneness. All things are seen as interdependent and inseparable parts of this cosmic whole; as different manifestations of the same ultimate reality.¹⁹

Capra's critics have demonstrated a deep distaste for the suggested connections; the physicist Jeremy Bernstein, for instance, certainly pulled no punches:

Thus I agree with Capra when he writes, 'Science does not need mysticism and mysticism does not need science but man needs both.' What no one needs, in my opinion, is this superficial and profoundly misleading book.²⁰

But these kind of criticisms, which perhaps have some degree of justification in the Capra case, as the parallels are not very precise, are not appropriate to such unexpected, surprising, and incredibly precise correlations such as we have surveyed above. One can imagine a Tibetan mystic snake-oil huckster using the claim 'All is One' as a sales pitch, but surely the idea that anyone would proclaim "all phenomena hover between existence, non-existence, both, and neither" as the banner-head for a mystical cult scam seems highly unlikely!

The idea that, prior to quantum physics, a physicist, or anybody else for that matter, would come up with the idea, on a whim, or an attempt at spiritual deception, that the objects of the everyday world were ultimately made up of stuff hovering between existence and non-existence is just absurd, because it is such an unlikely claim - *even though it turns out to be true*.

Even, today, the significant physicist Roger Penrose still finds it hard to contemplate:

Undoubtedly the world is strange and unfamiliar at the quantum level, but it is not unreal. How, indeed, can real objects be constructed from unreal constituents?²¹

The quantum gravity theorist Lee Smolin, for instance, says of the Uncertainty Principle, which is a manifestation of the existence-hovering scenario, and which states that it is not possible to know a quantum particle's precise position and momentum at the same time, that:

...the mind rebels: it is hard to work one's way through to the logical consequences of a principle like the uncertainty principle when one's first response is simply to disbelieve it. I myself do not really believe it, and I do not think that I am the only physicist who feels this way. But I persist in using it because it is a necessary part of the only theory I know that explains the main observed facts about atoms, molecules and elementary particles.²²

Physicists Bryce DeWitt and Neill Graham have written that:

No development of modern science has had more profound impact on human thinking than the advent of quantum theory. Wrenched out of centuries-old thought patterns, physicists of a century ago found themselves compelled to embrace a new metaphysics. The distress which this reorientation caused continues to the present day. Basically physicists have suffered a severe loss: their hold on reality.²³

And Heisenberg, the originator of the Uncertainty Principle and Quantum Matrix Mechanics, lamented after a dinner party:

Can nature possibly be as absurd as it seems to us in these atomic experiments?²⁴

These are just a few of the expressions of disbelief on the part of modern quantum physicists. The notion that some Indian or Tibetan mystical Buddhist con-artists, or even misguided mystical dreamers, would come up with such a bizarre formulation of ultimate existential hovering is ludicrous!

As indicated previously, another ludicrous claim on the part of anti-quantum-mysticism activists is that there can be no claims concerning any foreshadowing by Buddhist *metaphysical* know-

ledge of quantum *metaphysical* insights, unless it can be shown that something like the Schrödinger equation can be found in Buddhist texts! Thus Jean Bricmond writes:

When one encounters claims about modern physics having been foreshadowed by ... Eastern traditions, the first question to ask is: where are the equations ... ?²⁵

But such a question would only be appropriate only if there was some claim made to have found the *mathematics* of quantum theory within a Buddhist text, for example. But no such claim has ever been made, certainly not in a Buddhist context. The claim of foreshadowing has always been restricted to the metaphysical dimension. However, as we shall see in the next few pages, in the case of the Buddhist four extremes of existence formulation, which has a central place in Madhyamaka philosophy, Buddhist philosophy comes fairly close to achieving a mathematical connection.

In his book *Quantum Mechanics and Experience* the physicist and philosopher David Z. Albert discusses the nature of quantum superposition, the quantum state of hovering in and out of existence. He considers the situation of a double slit experiment involving an example fictional pair of quantum properties, color and hardness. In this context these are not actual properties which quantum systems have, they are used for demonstration and analysis purposes. The fake experiment described by Albert is based on an actual experiment, but is described in simplified form for presentation purposes, hence the fake attributes used. The fictional example experimental setup is shown in figure 1, electrons are fed, one at a time, into a contraption which divides them up depending on the ‘hardness’ attribute; ‘hard’ electrons are diverted to the left and thus emerge out of the top opening in the diagram, ‘soft’ electrons travel straight through as shown. The hard electrons ostensibly travel on route *h* whilst soft are supposed to travel along route *s*. The split beam is reunited at the ‘black box’ and emerge together along path *h and s*. Various observations are described as being made using this setup.

In his book Albert gives the details of what actually happens in the fake demonstration experiment, mirroring the details of the more

complex actual experiment. The conclusion that Albert is forced to adopt by the results is that:

It's that any electron's even *having* any definite color apparently entails that it's neither hard nor soft nor both nor neither, and that any electron's even having any definite hardness apparently entails that it's neither black nor white nor both nor neither.²⁶

So, when an electron is 'measured' so that its has a definite hardness then it will be forced into in a quantum superposition of whiteness and blackness. And this state of being in a quantum superposition means that the electron is **neither black nor white nor both nor neither**. In other words the condition of being **neither this nor that nor both nor neither** can be identified with the state of being in a quantum superposition. If the electron is 'measured' into being white then it is forced into a quantum superposition of hardness and softness :

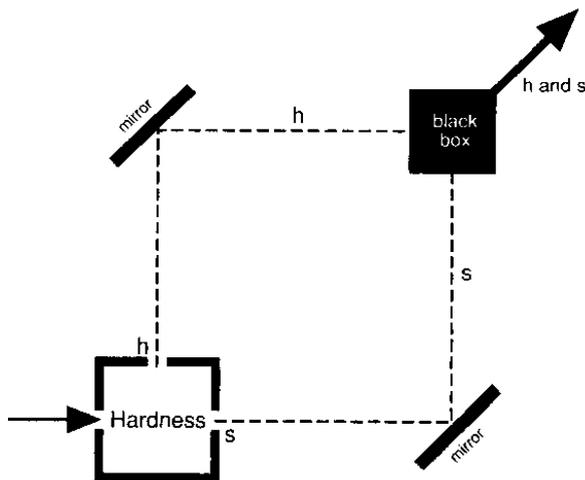


Figure 1

So, it follows that a white electron can't *be* a hard one, or a soft one, or (somehow) both, or neither. To say that an electron is white must be just the same as to say that it's in a *superposition* of being hard and soft.²⁷

And Albert is adamant that:

... it isn't *at all* a matter of our being unable to simultaneously *know* what the color and the hardness of a certain electron is (that is: it isn't a matter of *ignorance*). It's deeper than that.²⁸

If an electron is measured to adopt a definite hardness, then its color flips into a superposition of possibility of color, which means that there actually is no definite color. It might be said that the color 'hovers' between black and white.

This conclusion, of course, is exactly the same as that indicated by Ghirardi (above), who tells us that quantum experiments show:

... unequivocally that Microsystems ... have modes of being and behaving that cannot be grasped through the conceptual schemes we have elaborated on the basis of our experience with macroscopic objects.²⁹

The experiment that Ghirardi analyses involves photons apparently travelling on one of two paths - an 'ordinary path', designated as $|\mathbf{O}\rangle$, and an 'extraordinary path', designated as $|\mathbf{E}\rangle$. And Ghirardi shows that the result indicates that photons end up in a quantum superposition hovering between states of being on one of the two paths:

Therefore, "to be in a superposition $|\mathbf{O}\rangle + |\mathbf{E}\rangle$ " is logically incompatible with any of the following "to be on path \mathbf{O} or \mathbf{E} ," "to be on both \mathbf{O} and \mathbf{E} ," and "to be elsewhere than \mathbf{O} and \mathbf{E} ."³⁰

Elsewhere Ghirardi tells us that this central quantum principle of superposition means that entities which from a macroscopic point of view should be in one place must at the quantum level, prior to a measurement being performed, be spread over many places. This means that if the quantum principle of superposition was operative at the macroscopic level, which it is not, a chair, for instance, would be hovering half in one place and half in another, without being divided into two halves, the entire chair would be potentially existent, but not fully existent, in both places, exactly like Schrödinger's cat, which, like Ghirardi's chair, was a thought experiment, not a possibility for an actual classical level living cat. If Ghirardi's chair were to be a quantum chair then:

...according to the formulism the chair can be found ... in a state analogous to that of the photon above:

$$| ? \rangle = 1/\sqrt{2} [|there\rangle + |here\rangle]^{31}$$

This leads directly and remarkably into the realm of Buddhist emptiness because the quantum existential four-cornered paradox is precisely identical:

Neither $|O\rangle$ or $|E\rangle$, nor both $|O\rangle$ and $|E\rangle$,
nor neither $|O\rangle$ nor $|E\rangle$

Or:

Neither $|here\rangle$ or $|there\rangle$, nor both $|here\rangle$ and $|there\rangle$,
nor neither $|here\rangle$ nor $|there\rangle$

And, as we have seen, this corresponds exactly to the Madhyamaka characterisation of the existential configuration of ultimate reality:

**Its character is neither existent, nor non-existent,
Nor both existent and non-existent, nor neither.**

Which is an extraordinary, semi-mathematical, demonstration of equivalence between the state of quantum superposition and the the Madhyamaka characterisation of the existential configuration of ultimate reality.

Physicist-philosopher David Albert is quite clear that quantum discoveries have caused an unwelcome injection of mystery into physics, saying that it is: “the most unsettling story, perhaps, to have emerged from any of the physical sciences since the seventeenth century.”³² In a discussion with the science journalist and anti-New-Age activist John Horgan, ‘Making Sense of Quantum Mechanics’, Albert has observed that:

Once upon a time, physics aspired to offer us an objective and literal and realistic and comprehensive and mechanical account of what the world is actually like. And that aspiration suddenly began to look quaint and naïve and hopeless, in the early decades of the 20th century, under the fantastic assault of quantum mechanics. And the interpretations of quantum mechanics that I like (although “interpretation” is really the wrong word here - since the various so-called “interpretations” on offer are really

different physical theories, which often make different empirical predictions) are the ones that show, by explicit example, that an account like that can still be had - interpretations...³³

It is important to note here that Albert refers to the quantum interpretations that he *'likes'*, not the interpretations he can argue for as being clearly more acceptable on evidential and logical grounds, in fact *he clearly indicates that there is no clinching-the-deal type of determination as to which 'interpretation' is the final one*. He admits that he prefers certain interpretations simply because he wants the universe to be a certain way. And what way is that? Albert wants no intrusion of "New Age nonsense", and will have no truck with the idea that consciousness is a major player in the process of reality. We can see this in the following section from the interview:

Horgan: Why does quantum mechanics inspire so much New Age nonsense?

Albert: Precisely (I guess) because quantum mechanics had for so long been understood - incorrectly - to have overturned every hope of understanding the world in an objective and literal and realistic and mechanical way.

Horgan: Is consciousness a solvable problem?

Albert: I sort of feel the ground coming out from under me when I try to think about that. I can't understand how physics could possibly give us a fully satisfactory account of consciousness, and I can't understand how physics could possibly fail, at the end of the day, to give us a fully satisfactory account of consciousness.³⁴

Even though Albert has said about 30 seconds earlier that there was no settled 'interpretation', and that he *liked* the less New-Agey perspectives, he has a congenital predilection, so to speak, for the more materialistic-mechanistic viewpoints, now, 30 seconds later, suddenly, out of the blue, he knows for certain that all New-Age perspectives have "incorrectly" construed the quantum situation. How could he possibly suddenly know this, he has just told us that there is no settled 'interpretation'? It's a quantum miracle!

Also, Albert indicates that he has no idea “how physics could possibly give us a fully satisfactory account of consciousness,” although he is dogmatically convinced that it must do at some point in the future. But, just about all New-Age accounts of the implications of quantum physics involve the view that consciousness is primary and significant in the process of reality. So, as he does not have any notion of how consciousness relates to, or connects to, or is generated by, the ‘physical’ world, how can he possibly know that New-Age accounts involving consciousness are “nonsense” This kind of dogmatic blanket dismissal of all New-Age claims involves intellectual obfuscation and thinly veiled academic smoke and mirrors, one might, perhaps, claim this is intellectual deception. It is quite possible that Albert is deceiving himself, due to brainwashing by the anti-quantum-mystical thought police.

In other contexts, perhaps contexts involving quantum perspectives Albert does not ‘like’, he is not slow to forcefully point out clear obfuscations and misleading claims. Thus, when the quantum-materialist physicist Lawrence Krauss published his book *A Universe From Nothing*, Albert took Krauss to task for his misuse of the word ‘Nothing’. In a review of Krauss’ book, Albert wrote:

The fundamental physical laws that Krauss is talking about in “A Universe From Nothing” — the laws of relativistic quantum field theories — The particular, eternally persisting, elementary physical stuff of the world, according to the standard presentations of relativistic quantum field theories, consists (unsurprisingly) of relativistic quantum fields. And the fundamental laws of this theory take the form of rules concerning which arrangements of those fields are physically possible and which aren’t, and rules connecting the arrangements of those fields at later times to their arrangements at earlier times, and so on — and they have nothing whatsoever to say on the subject of where those fields came from, or of why the world should have consisted of the particular kinds of fields it does, or of why it should have consisted of fields at all, or of why there should have been a world in the first place. Period. Case closed. End of story.³⁵

In other words, physics has not located “Nothing” at the base of the process of reality, as far as we currently know the ground level of the base of the process of reality consists of “eternally persisting ...relativistic quantum fields.”

Quantum fields, according to the current understanding of physics, are the primary aspect of the process of reality, particles are derivative because they are excitations of the particle’s quantum field, each particle has an underlying quantum field, and when a particle’s quantum field is excited in some fashion (which excitation-fashion is fashionable depends on which physicist one asks!) then a particle comes into being due to the field excitation. Despite the fact that many physicists detest any notion that consciousness could possibly be involved, it is generally accepted that it *seems* as if observation is in some way involved in producing particles from the wave-nature of fields. Real, serious, hard-headed, no-nonsense physicists know, of course, they feel it deep in their bones and their gut so to speak, that it cannot possibly be true that observation and consciousness have anything whatsoever to do with this process!

An interesting aspect of this story, however, is that the particle-like excitations of quantum fields, which function as ‘particles’, were, in the quantum field theory being developed, missing their mass, without which they were a poor excuse for matter, not being weighty enough for true existence, and so, another quantum field was required. This extra field functions so that these mass-deficient particles interact with it in order to get their mass and then, because of the interaction, they become real massive particles, so to speak, fully paid up and functional bits and pieces of material reality:

The basic equations of the unified theory correctly describe the electroweak force and its associated force-carrying particles, namely the photon, and the W and Z bosons, except for a major glitch. All of these particles emerge without a mass. While this is true for the photon, we know that the W and Z have mass, nearly 100 times that of a proton. Fortunately, theorists Robert Brout, François Englert and Peter Higgs made a proposal that was to solve this problem. What we now call the Brout-Englert-Higgs

mechanism gives a mass to the W and Z when they interact with an invisible field, now called the “Higgs field”, which pervades the universe.³⁶

And, amazingly and conveniently, it seems that this mass-giving field does grow out of nothing (I am surprised Krauss did not use this in his defence!):

Just after the big bang, the Higgs field was zero, but as the universe cooled and the temperature fell below a critical value, the field grew spontaneously so that any particle interacting with it acquired a mass.³⁷

As many people know, the Higgs field was confirmed for physicists when the results of particle collisions at CERN indicated the expected traces.

An intriguing aspect of this situation is that, it seems that, when a fundamental aspect of everyday life such as mass goes missing, physicists are immediately on the hunt for a quantum field, spending vast sums of money to trap its signature. But when it comes to the most fundamental aspect of our embodied, experiential everyday world, consciousness, which is the very aspect of the process of reality which enables us to perceive the embodiment of mass, i.e. matter, and, in the case of physicists, hunt for mass using a vastly expensive particle accelerator, many physicists think, and often appear desperate to prove, that this seemingly foundational aspect of our world, an aspect completely dissimilar to matter in every way, is nothing special, just bits of matter banging around in a weird way. The idea that consciousness might be very special, and might be entitled to its own field, so to speak, is ridiculed without mercy. This deep antipathy seems to be a quantum-materialist reflex-response driven by academic dogmatic necessity to keep Mind away from the quantum action, whatever the evidence might be.

For many physicists, the idea that consciousness might be special enough to have its own field, quantum or otherwise, is, as a matter of dogma, considered delusional and anti-scientific. Instead, many physicists, such as Max Tegmark, claim that consciousness can only be matter arranged in weird and wonderful configurations. According to Tegmark the specified ‘state of matter’, or ‘state of

mathematics' (it seems that Tegmark has not decided which of these, non-equivalent, terms to use yet in his intellectual scam) which magically, supposedly, creates consciousness, is called 'perceptronium'. As far as I know, he has not given a precise molecular description, it seems to be more like a schoolboy dream at the moment. Tegmark does not seem to be able to use his own 'perceptronium' to perceive that giving a fancy word to a non-existent entity does not bring that entity into existence. If it were the case that pretty words could conjure up 'real' entities there would be a lot of unicorns around!

An important issue not addressed or explained, in this scientific adolescent fantasy, is, if the underlying quantum fields which give rise to the excited particles of the material world, do not have an internal quality of consciousness, how is it at all possible for arrangements of these particles, when arranged in magical patterns, to give rise to an aspect of the process of reality which has completely novel immaterial features, features that are completely absent, we are told, from the quantum fields in the first place?

When such questions are addressed to pundits promoting the 'mindless matter magically organises itself to acquire consciousness' academic scam-show, another word is pulled out of a magic hat in the hope it will work some magic without further questions. It's all due to 'emergence'! Consciousness just 'emerges', just like water 'emerges' from the molecules of H_2O , now shut up! In various articles and talks Tegmark has suggested that in the same way as under certain conditions various states of matter, such as steam, water, and ice, can arise, so too can various forms of consciousness.

However, physicist Henry Stapp, who, unlike Tegmark, analyses proposals with rigorous clarity, has thoroughly demolished such vague and impressionistic fairy tales. The 'emergence' claim is sometimes given the important sounding technical term 'supervenience', to make it sound more impressive. The properties of water, for example, are said to 'supervene' or 'transcend' the molecular structure of H_2O . Such supervenience claims for water, however, do not hold water. Stapp explains this by referring to the neuropsychologist Roger Sperry's absurd example of how 'wheelness', according to Sperry, can be claimed to 'emerge' or

‘supervene’ from the atomic components of the physical stuff of a wheel. Stapp explains that:

The reason that consciousness is not analogous to wheelness ... is that the properties that characterize wheelness are *entailed* ... by properties specified in classical physics, whereas the properties that characterize consciousness ... are not entailed ... by the properties specified by classical physics.³⁸

Stapp is indicating that the conceptual move from the atomic structure of a wheel, including the atomic forces, to the properties of ‘wheelness’, which are embodied within a ‘wheel’, are *coherently entailed* within the conceptual framework of the classical physics of materiality in a manner that the properties of consciousness are not. There is:

... a huge difference-in-principle that distinguishes consciousness from things that, according to the precepts of classical physics, are constructible out of the particles that are postulated to exist by classical physics.³⁹

The way in which the material particles within the construction a wheel function as the wheel rotates over a surface quite naturally contribute to the overall functioning of the wheel in a manner that requires no discontinuous conceptual break. The properties of a wheel naturally emerge from the properties of materiality in a way that the properties of consciousness do not naturally ‘emerge’ from any configuration of molecules. In other words there is an explanatory chain of conceptual connection between the properties of the material wheel and the atomic constituents of the wheel, which is absent in any story of molecules to consciousness. This is the central core of what the philosopher David Chalmers has called the ‘hard’ problem of consciousness.

The same situation of conceptual coherence of explanation as for the wheel, applies to the supposed ‘emergence’ or ‘supervenience’ of wetness over and above the molecular make up of water. We find that the property of ‘wetness’ is coherently entailed by the nature of the intermolecular forces between particles which are stronger than the kinetic energies of the molecules, which are thus held close together. But, on the other hand these forces do not hold the molecules in a rigid structure and hence the molecules can

move around whilst being constrained to be close together. This coherently explains the nature of the liquid state. It is possible to clearly see how the molecular construction of water leads to its higher level properties:

Water has long been known to exhibit many physical properties that distinguish it from other small molecules of comparable mass. Chemists refer to these as the “anomalous” properties of water, but they are by no means mysterious; all are entirely predictable consequences of the way the size and nuclear charge of the oxygen atom conspire to distort the electronic charge clouds of the atoms of other elements when these are chemically bonded to the oxygen.⁴⁰

So even the more apparently ‘mysterious’ properties of water, being less dense in the solid form of ice for example, are “entirely predictable” from the molecular structure. In both the ‘wheelness’ and the ‘wetness’ examples there is a clearly coherent conceptual chain of entailment from the molecular basis to the property is said to ‘supervene’, or ‘emerge’. In the case of consciousness, however, there is an unbridgeable conceptual gap which no sophisticated and sophistic juggling of spurious logical concoctions could ever bridge. There is absolutely no way to see a clear conceptual or, even, ‘physical’, bridge from any molecular arrangement to the qualities of consciousness.

There is no configuration of molecular interconnection which can account for an internal ‘lighting-up’ of awareness, clarity, luminosity, knowingness and so on. The idea that one might be peering into an advanced quantum-microscope, observing the construction of a molecule of ‘perceptronium’, and, when the last atom is in the right place, so to speak, you suddenly see the molecule quiver and light up with its internal light of consciousness, is ridiculous. In the same way there is no conceptual account which naturally and clearly accounts for the inner qualities of consciousness by looking at the intra-molecular details of any molecule, however complex it may be. And, it is because of this fact, that Tegmark, and his associates in the perceptronium scam, conveniently forget about the central and most significant aspect of consciousness, which is the direct and immediately experienced first person awareness, and use in its

place more amenable secondary features which they, invalidly, claim are sufficient to cover the full significance of consciousness:

Tegmark discusses perceptronium, defined as the most general substance that feels subjectively self-aware. This substance should not only be able to store and process information but in a way that forms a unified, indivisible whole. That also requires a certain amount of independence in which the information dynamics is determined from within rather than externally.⁴¹

At first look this may look innocuous. After all, in this view consciousness is *defined* as the first-order quality of being “subjectively self-aware.” And, of course, this is a reasonable definition of consciousness. The issue, however, lies in the properties that Tegmark and others claim can be used to *presume the fact of the presence* of subjective self-awareness, because, obviously, you cannot see it directly. In this regard Tegmark takes the view of Integrated Information Theory, which was concocted by neuroscientist Giulio Tononi:

In 2008, Tononi proposed that a system demonstrating consciousness must have two specific traits. First, the system must be able to store and process large amounts of information. In other words consciousness is essentially a phenomenon of information. And second, this information must be integrated in a unified whole so that it is impossible to divide into independent parts. That reflects the experience that each instance of consciousness is a unified whole that cannot be decomposed into separate components. Both of these traits can be specified mathematically allowing physicists like Tegmark to reason about them for the first time.⁴²

The problem with such an approach, however, is that while these two traits maybe aspects of consciousness, to claim that they are *sufficient for assuming the presence of consciousness, or that they are even the foremost aspects of consciousness, is worse than dubious.*

The ‘physical’ world is, at root, defined in opposition to the mental world. In other words, these two fundamental aspects of the process of reality are defined as having no no common, or

overlapping, essential qualities. The founding view underlying the sciences is provided by the metaphysical perspective initiated by Descartes in the early seventeenth century, although these days, for the great majority of scientists, God has dropped out of the picture:

The main metaphysical results that describe the nature of reality assert the existence of three substances, each characterised by an essence. The first and primary substance is God, whose essence is perfection. In fact, God is the only true substance, that is, the only being that is capable of existing on its own. The other two substances, mind and matter, are created by God ... The essence of matter is extension in length, breadth, and depth. One might speak here of “spatial extension,” ... This extended substance possesses the further “modes” of size, shape, position, and motion. ... In addition to its essence, extension, matter also has the general attributes of existence and duration. The individual parts of matter have durations as particular modes. All the modes of matter, including size, shape, position, and motion, can exist only as modifications of extended substance. The essence of mind is thought. Besides existence and duration, minds have the two chief powers or faculties previously mentioned: intellect and will. ... for Descartes, consciousness is the defining property of mind.⁴³

An important point to note here is that, in the Cartesian view, it is only matter that has attributes and ‘modes’ which are amenable to measurement and subsequent mathematical representation. So the spectacularly successful scientific project got off the ground and proceeded with its extraordinarily successful investigation and manipulation of the material world, by ignoring the aspect of the process of reality which could not be measured, mind and consciousness, and focuses only on what can be measured, the material world.

At some point along the way, probably best located in the mid to late nineteenth century, the general consensus within the scientific community moved towards the view that the material world is primary, in fact in essence it became the central view that matter is ultimately all that the process of reality consists of, and

consciousness, must, in a magical way yet to be determined, be a product of mindless matter in strange configurations. This view has now become so embedded that, as we have seen, the most ludicrous and misleading claims can be made by physicists and philosophers, within the ‘material-world-only’ paradigm, and they remain unchallenged by the mainstream scientific community.

In his recent (2020) book *Until The End of Time: Mind, Matter, and Our Search for Meaning in an Evolving Universe*, Brian Greene declares, at an early point on page six, the accepted dogma of the ruling scientific elite, that consciousness emerges from the restless mingling of material ‘particles’ at the end of a long evolving road of molecular organization. He does this in an offhand, unremarkable observation, after all, we all know it’s true, don’t we? Greene writes: “These are all ongoing stories, developed by thinkers hailing from a great range of distinct disciplines. Understandably so. A saga that ranges from quarks to consciousness is a hefty chronicle.” But, is this true? Do all stories really range from quarks to consciousness?

Anyway, on page six Greene has implicitly, perhaps inadvertently, given us his preferred route. It is only on a much later page that we discover the route may not exist, or may be impassable. And Greene’s admission of possible lack of material route to consciousness is couched in almost offensive language, which verges on claiming that the many significant physicists who seriously disagree with his opinion, and it is an opinion not established fact, are fools. In his response to the view, which is endorsed by some significant physicists, that: “consciousness would thus be an intimate participant in quantum physics,” he writes:

You can see the appeal. ... Quantum mechanics is mysterious. Consciousness is mysterious. How fun to imagine that the mysteries are related, or are the same mysteries, or that each mystery resolve that of the other. But in my decades of immersion in quantum physics, I have not encountered a mathematical argument or experimental data that have shifted my long-held assessment of the purported link: extraordinary unlikely. ... there is no foolproof argument that consciousness does not play a

special quantum role. Still, ... the proposed quantum-consciousness connections are tenuous.⁴⁴

It can be seen that Greene is pretty intellectually dismissive. But his dismissive attitude has little basis in evidence and analysis. His “assessment” is based on a preformed anti-quantum-mysticism prejudice. Note how Greene uses the oft-repeated fallacious claim that the only reason to connect consciousness and the quantum realm is that they are both ‘mysterious’. As we have seen previously, this is simply not true, but is a claim often made by those unfortunate beings whose quantum consciousnesses have become infected by the virulent anti-quantum-consciousness derangement syndrome!

There is no completely irrefutable way to remove consciousness from the quantum situation, as revealed by experiment, unless you lower your standards of logical coherence, and perhaps sanity, and thereby concede to laughably absurd accounts of the process of reality, like the Many-Worlds schoolboy fantasy, Bohmian quantum mechanical cross-universal instantaneously interconnected ‘pilot waves’ pushing particles around, or mystical spontaneous collapse of wavefunctions for no good reason as proposed by the Ghirardi–Rimini–Weber (‘GRW’) quantum cabal. Such ‘interpretations’ are called ‘ontological interpretations’ because they attempt to give a precise and comprehensive ‘classical’ type story about the ontology of the process of reality that functions at the quantum level, thereby expelling the upstart and irritating spectre of consciousness from the quantum realm. To give him his deserved due, David Bohm quickly realised his attempted assassination of quantum-consciousness was intellectually unacceptable, and he went on to develop an excellent quantum philosophy of wholeness, which is explored in my book *The Tibetan Book of the Undivided Universe*.

As Michael Epperson, in his book *Quantum Mechanics and the Philosophy of Alfred North Whitehead*, points out regarding such ‘ontological interpretations’, which “attempt to equip quantum mechanics with a descriptive power comparable in strength to its predictive power,” that:

...in the attempt to produce a characterization of nature as predictably and descriptively satisfying as that given by classical mechanics, these and other interpretations so contort the very classical fundamental materialism that they attempt to preserve that one tends to feel even less satisfied with these “classical” interpretations of quantum mechanics than one felt with no ontological interpretation at all.⁴⁵

Furthermore, there cannot be a purely mathematical demonstration of the role of consciousness, as Greene wishes for, exactly because consciousness is not measurable. And Greene’s claim that anyone who thinks, and offers reasons for the claim that consciousness plays a role at the quantum level can only be a fool, when he tells us it is not possible to produce a “foolproof” counter-argument, is simply an intellectually thuggish dirt-throw, without evidence or reason. The main problem that anti-quantum-consciousness hucksters like Greene have is that they cannot come up with any viable account, ‘foolproof’ or otherwise, of how the abject, dark, and mindless world of absolute and irredeemably non-conscious, perhaps even anti-consciousness on their own account (after all they produced Carroll and Greene), quantum fields, magically manufacture mind!

The trope about the idea that the perceived common mystery of consciousness and quantum mechanics could only be taken to be significant by non-serious people seeking fun, or delusional delinquents, occurs on several occasions in works of this kind. One gets the idea that there is a cabal of anti-quantum-mystical activists who discuss and share propaganda plans at dinner parties. Here is Sean Carroll’s version in his recent book:

There is a long history of claiming that human consciousness is necessary to understand quantum mechanics, or that quantum mechanics may be necessary to understand consciousness. Much of this can be attributed to the impression that quantum mechanics is mysterious, and consciousness is mysterious, so maybe they may have something to do with each other.⁴⁶

The assertion that the idea that the connection between consciousness and the quantum realm is merely based upon a vague apprehension of ‘mystery’ is, as just mentioned, nonsense.

The claim of a quantum significance for consciousness is actually based on an unbiased, integrity-laden evaluation of the experimental evidence, unburdened by a desperation to have a supposedly ‘realistic’, which means devoid of consciousness, account of the process of reality with no sign of consciousness getting in on the quantum scene. This is how quantum-materialists preconceive, without evidence or reason, the process of reality to function.

The Devilish materialist philosopher Daniel Dennett was perhaps the first to deploy the ‘matching mysteries’ supposed debunking argument in his attempt at a scathing dismissal of connections between the phenomena of consciousness and the quantum realm:

... by wedding two bits of magic together you are going to say it’s not magic. By letting consciousness be a mysterious and magical property, in saying that quantum enlargement in effect depends on consciousness you nicely tie together two themes and I think it’s just magical thinking. There is no reason to believe either side of it.⁴⁷

But, in fact, the truth of the issue is that it is clearly *not* the case that there is “no reason to believe either side of it.” As with so much of Dennett’s supposedly ‘philosophical reasoning’, there is actually no philosophical reasoning just materialist dogma. For, as we have seen, the physicists Bruce Rosenblum and Fred Kuttner have vigorously concluded from their quantum investigations:

Consciousness and the quantum enigma are not just two mysteries; they are *the* two mysteries; first, our physical demonstration of the quantum enigma, faces us with the fundamental mystery of the objective world ‘out there;’ the second, conscious awareness, faces us with the fundamental mystery of the subjective, mental world ‘in here.’ Quantum mechanics seems to connect the two.⁴⁸

And their analysis of the evidence forces them to the conclusion that not only does this connection ‘seem’ valid, *it is valid*. The current state of physics clearly suggests that consciousness is in some way implicated at the quantum level. According to Rosenblum and Kuttner physics has now shown that at the quantum level:

...physics' encounter with consciousness, demonstrated for the small, applies to everything. And that 'everything' can include the entire Universe.⁴⁹

The Russian physicist Michael Mensky also concluded that it is consciousness that acts to select out quantum possibilities from the myriad potentialities within the quantum realm:

In this assumption, two unclear concepts, one from quantum mechanics and the other from psychology, are identified and thus 'explain each other'.⁵⁰

As Mensky, an expert in "quantum field theory and quantum gravity (especially on application of group-theoretical methods in this field), quantum theory of measurements and foundations of quantum physics,"⁵¹ says:

...a theory that would describe not only the set of alternative results of measurement and the associated probability distribution, but also the mechanism of the selection of one particular result, ought to include the mind (consciousness) of the observer.⁵²

The "alternative results" referred to here refers to the large number (possibly infinite) of potential outcomes contained within a quantum wavefunction, one of which will be actualised by measurement.

According to Mensky, it is necessary to include consciousness in any account of quantum functioning at this level, it is required by the very act of making a quantum 'measurement', a view endorsed by a few other significant physicists such as Stapp. Dennett, as we have seen, disagrees. But it is worth pointing out that Mensky, to emphasize, is an expert in "quantum field theory and quantum gravity (especially on application of group-theoretical methods in this field), quantum theory of measurements and foundations of quantum physics," as opposed to Dennett, who makes dubious claims to be a 'philosopher', although at the same time has also claimed, in his mis-titled book *Consciousness Explained*, that his consciousness does not really exist, being nothing other than atoms banging around inside his skull. To my mind, anyone lacking real functioning consciousness located to

some extent inside his skull can hardly be considered a philosopher!

Mensky explicitly indicates that:

...the consciousness as a whole splits between the alternatives but the individual consciousness subjectively chooses (selects) one alternative.⁵³

In another words, Mensky suggests that consciousness is able to somehow 'look', 'feel', or 'explore' ahead into the possible quantum paths and select the most appropriate one. This might seem like a remarkable capacity, but it is not unknown in nature, it is exactly how photosynthesis works. In 2007 a study carried out by researchers at the U.S Department of Energy's Berkley Lab and the University of California discovered that the answer for the high efficiency of photosynthesis, a vital and fundamental mechanism of life, lies in the quantum mechanics of the process. A quantum wavelike electronic coherence plays an important role:

The wavelike characteristic can explain the extreme efficiency of the energy transfer because it enables the system to simultaneously sample all the potential energy pathways and choose the most efficient one.⁵⁴

According to Mensky this is an aspect of the functioning of consciousness, in this case primordial consciousness operating within the plant realm. The dogmatic desire to cling to a crude materialist worldview when physics has discovered the immaterial realm of the quantum fields underlying the appearances of the material world simply makes no sense, unless there is some preformed, perhaps due to some psychological predisposition, hidden agenda. As Henry Stapp has pointed out: "proclaiming the validity of materialism on the basis of an inapplicable-in-this-context nineteenth century science is an irrational act."⁵⁵

The most natural way to conceive of a kind of quantum field of consciousness is to use the example of the Higgs field as a loose initial analogy. Whereas the Higgs field gives mass to material 'particles', the non-individuated, universal quantum consciousness field can be conceived of as activating individuated centers of consciousness within certain configurations of the material world - brains. This view, that consciousness is an all pervading quantum-

level field of primordial-intelligence-awareness, is now gaining strong support from research into the phenomenon of Near-Death-Experiences (NDEs). The cardiologist Pim van Lommel, who has studied near-death experiences (NDEs) in patients who survived a cardiac arrest for more than twenty years, writes that:

... according to our current medical concepts it is not possible to experience consciousness during a cardiac arrest, when circulation and breathing have ceased. But during the period of unconsciousness due to a life-threatening crisis like cardiac arrest patients may report the paradoxical occurrence of enhanced consciousness experienced in a dimension without our conventional concept of time and space, with cognitive functions, with emotions, with self-identity, with memories from early childhood and sometimes with (extra-sensory) perception out and above their lifeless body. In four prospective studies with a total of 562 survivors of cardiac arrest between 11% and 18% of the patients reported a near-death experience, and in these studies it could not be shown that physiological, psychological, pharmacological or demographic factors could explain the cause and content of these experiences.

Materialists, of course, might enthusiastically leap on the fact that this occurs in only between 11% and 18% of the patients, why could this be? The answer is simply that not all, in fact very few, people develop the internal qualitative field of their consciousness to a point wherein this can occur.

Furthermore, this bestowal of the individuated clarity, awareness and cognitive intelligence is not the only function of the deep primordial awareness, there is good reason to believe that primordial awareness-consciousness is also the driving force which stirs the immaterial fields of quantum potentialities into manifestation at the ground level of the process of reality. As Deiter Zeh indicates in his quote from Greek philosopher Anaxagoras: “When Mind began to set things in motion, separation took place from each thing that was being moved, and all that Mind moved was separated.”⁵⁶

It is intriguing to meditate on the way in which the Buddhist *Madhyamaka*, the ‘Emptiness School’, and the Buddhist *Yogacara*,

the ‘Yoga-Practitioner Consciousness-Only School’ can be viewed as complementary aspects of the Mahayana Buddhist analysis of the nature of the process of reality, in a similar manner to quantum ‘particle-wave’ duality. Firstly, the Madhyamika analysis analytically dissolves the seeming solidity of the material world down to ‘particles’ and then beyond into a deeper of insubstantiality:

Like their Yogacara counterparts, the Madhyamikas too reject the idea of substantial atoms proposed by the Buddhist atomists. In fact, the Madhyamika view questions the very project of grounding reality, be it matter or mind, in any kind of ultimate indivisible elements. What are said to be indivisible atoms by others are nothing but smallest conceivable units of matter that cannot be physically divided further but that still can be characterised as possessing spatial locus and sides.⁵⁷

Whereas some Buddhist schools proposed the existence of substantially existent atoms, and ended their analysis of the process at this level, both the Yogacara and Madhyamaka schools carry the analysis further. In the case of the Madhyamaka, the “very project of grounding reality” is invalid. Our experience of the apparently material world can be conceptually broken down into “smallest conceivable units of matter that cannot be physically divided further,” but this does not mean that there really are fully paid up substantial bits and pieces actually fully existing ‘out there’. This conclusion, reached by Buddhist philosophy roughly two thousand years ago, certainly seems to chime with modern quantum conclusions forcefully endorsed by some significant quantum physicists and philosophers today. Thus the physicist Paul Davis has proclaimed that:

The concept of a particle is purely an idealised model of some utility in flat space quantum field theory. Away from that limited context, however, the concept becomes much less useful and has been the source of much confusion. The study of ... particle detectors has exposed the nebulousness of the particle concept and suggests that it should be abandoned completely.⁵⁸

The significant physicist H.-Dieter Zeh, has published a 1993 a paper entitled:

There are no quantum jumps, nor are there particles!

And the quantum philosopher Michael Bitbol has commented that:

...speaking in terms of elementary particles can only be done either at the cost of alleviating the corpuscularian connotation of the word particle, or by restricting the relevance of this word to a certain class of experimental situations. In modern physics, “particle” is a word that is carefully redefined in such a way that it does not really mean what it so strongly evokes.⁵⁹

In other words, the word ‘particle’, as used in physics, does not mean what the person in the street thinks it might mean. It is more like a convenient ‘fiction’ usefully used in certain contexts.

According to the Madhyamaka analysis, ultimate reality can not be asserted as being of the substantial nature of matter, nor of mind, thus refuting other Buddhist schools which considered that the ultimate nature of reality consisted of substantial moments of existence and consciousness. Indeed the Madhyamika viewpoint seems remarkably anticipatory of the Bohr view, which at least appears to leave the ultimate quantum nature hanging in the realm of the unspeakable. As the philosopher-physicist Bernard d’Espagnat has pointed out, the ultimate quantum nature of the ‘veiled’ reality of the everyday world seems consistent with the Buddhist Madhyamaka conclusion which:

...rejects the notion of a ‘ground of things’ and even lays stress on the opposite notion, the one of an ‘absence of foundation’ or ‘emptiness.’⁶⁰

From the point of view of the Madhyamaka, if we are asked whether appearing ‘particles’ really ‘exist’, the answer is that:

From certain single perspectives
[The Buddha] taught them as either ‘nonexistent’ or
‘existent.’

From both perspectives,
He expressed them as ‘neither existent nor nonexistent.’
Since they do not exist as they appear,
He talked about their ‘nonexistence.’
Since they appear in such ways,

He spoke about their ‘existence.’⁶¹

Thus, the Madhyamaka seems to remove the ground of existence from existence, in a manner entirely consistent with the quantum views outlined previously, leaving it in a field of indeterminacy, an empty quantum field of neither existence nor non-existence.

The fundamental, the ‘pure’, Madhyamaka position leaves the analysis at this point, leaving a practitioner hanging between existence and non-existence, so to speak. And, from the point of view of Buddhist experiential practice, when such an understanding is internalised as direct experience, this position can be very exhilarating and liberating. But, contrary to the hardcore Madhyamika perspective, this cannot be the end of the metaphysical story. For we must ask, what aspect of the process of reality is performing such a precise metaphysical analysis into emptiness?

The sixth century Madhyamika Chandrakirti pointed out that:

How can you say the elements, which are the object of your mind,
Compose the latter’s nature? This surely cannot be!⁶²

Here Candrakirti indicates that the assertion that ‘the elements’, which today we can take to be what we can consider to be the quantum ‘particles’ generally considered to generate consciousness by some material magical quantum magic, cannot logically be considered to generate the very field of awareness that is perceiving them. And, more tellingly, Chandrakirti then points out that this is impossible because ‘the elements’, or in today’s parlance ‘quantum particles’, do not exist in the way they would need to in order to have such causal powers. The Madhyamaka analysis indicates that all assumed ‘particles’ are empty of such inherent existence. So consciousness is left hanging in a space of perception, perceiving appearances from emptiness. Furthermore, Chandrakirti, being a thoroughgoing Madhyamika, dissolves into emptiness both external objects *and the perceiving mind*:

For once the outer objects of cognition are disproved,
...the knowing mind is easily refuted.
Perceiver is discounted with the percept;
The outer world was thus refuted first.⁶³

When this assertion is misunderstood it can appear as if the status of the perceiving mind in is completely negated. But this is not the case. It is the substantial inherent existence of Mind which is being refuted. In other words, Mind should not be considered to be a substantial aspect of the process of reality on the same level as the material world. The 4th to 5th century Yogacara philosopher Vasubandhu wonderfully describes this:

Through the perception of mind-only
One achieves the nonperception of objects;
Through the nonperception of objects
There is also the nonperception of mind.

Through the nonduality of perception,
Arises the perception of the fundamental nature of reality.
Through the perception of the fundamental nature of reality
Arises the perception of the radiant.⁶⁴

However, this is not an assertion of the utter and complete non-existence of mind, it is the assertion of the deeper non-substantial nature of mind. We are left with the empty ‘radiance’ of the quantum-level field of the fundamental nondual cognitive radiant capacity which is Primordial Mind.

The term ‘consciousness’, is designated, in Buddhism, ‘*vijñana*’. This term indicates a division (‘*vi*’) into a dualistic subject-object experiential continuum that manifests within an undivided field of nondual primordial awareness, which is ‘*jñana*’. In another related context, *vijñana* is taken to be a ‘life-force’ because the process of division produces the processes of life. *Jñana* is the Buddhist term for undivided primordial awareness, often termed ‘wisdom’, but the word ‘wisdom’ here does not indicate worldly-wise knowledge, although that may be an aspect, it primarily refers to direct and immediate contact with primordial nondual awareness. The prefix ‘*vi*’ indicates a cut, a division, in *jñana*, a division of primordial awareness into interrelated subject-object fields of individuated experience. These are the multitudinous streams of consciousness of all sentient beings. At the same time as nondual primordial awareness, which has an associated aspect of potentialities for dualistic manifestations (quantum potentialities), manifests into duality, it manifests a collective illusory veil of an apparently material world shared by the manifested streams

of consciousness of manifested sentient beings. This is indicated by John Wheeler, although he was obviously unaware of the relationship of his insight to Buddhist metaphysics, as follows:

Directly opposite to the concept of universe as machine built on law is the vision of *a world self-synthesized*. On this view, the notes struck out on a piano by the observer participants of all times and all places, bits though they are in and by themselves, constitute the great wide world of space and time and things.⁶⁵

Thus the manifold perceptive activities of all sentient beings, the majority of these being unconscious from the perspective sentient beings, over vast stretches of time, create a thin veil of appearances, which dramatically appears to be a solid material world, even though it is ultimately ‘empty’; physics shows that the appearance of the material world is 99.999999999999% empty space! As one Tibetan Madhyamika adept playfully expressed this: ‘things do exist, but only just’. One might say they hover on the edge of existence!

Why does this manifestation take place? Because there is a fundamental cognitive force, a drive to ‘know itself’, within the ground of the process of reality . A Sufi hadith, or saying, expresses this situation of the unknown universal primordial awareness of the process of reality in search of its own nature as follows:

I was a hidden treasure and I longed to be known,
So I created both worlds, the visible and the invisible,
In order that My hidden treasure ... would be known.⁶⁶

And this process arises from the ground of primordial cognition and the quantum fields of potentiality.

The concept of a ‘field’ involves the idea of a continuous extension of influence which has influence at every point of space and time. In quantum field theory fields can be thought of as being eternally present fundamental ‘fields’ or ‘seas’ of potentiality underlying, and giving rise to, all the phenomena of the everyday world. Physicist Lisa Randall gives the following description:

Quantum field theory, the tool with which we study particles, is based upon eternal, omnipresent objects that

can create and destroy those particles. These objects are the “fields” of quantum field theory. ... quantum fields are objects that permeate spacetime ... they create or absorb elementary particles ... particles can be produced or destroyed anywhere at any time.⁶⁷

All ‘particles’ are excitations, perturbations in the underlying associated quantum field. Each type of particle has its own field and when the field is somehow excited a particle or several particles can be ‘created’ and when the excitation ceases particles are ‘destroyed’. Randall, in line with the official anti-quantum-mystical decree operative within mainstream physics, does not address the issue of exactly what quantum fields get excited about! But Sean Carroll, in a momentary lapse of scientific political-correctness, has written:

The physicist John Wheeler once proposed a challenge: How can you best explain quantum mechanics in five words or fewer? ... the best answer was given ... “Don’t look: waves. Look: particles.” That’s quantum mechanics in a nutshell.⁶⁸

And, the last time I looked, ‘looking’ involved consciousness!

The physicist H. Deiter Zeh has proclaimed that:

However you turn it: In the beginning was the wavefunction.⁶⁹

And, when put together with his other dramatic assertion that “nor are there particles!,” it is clear that Zeh, like most physicists, considers the quantum wavefunction, which is a mathematical representation of quantum fields, to be the fundamental ground of the process of reality. Furthermore, Zeh, indicates that he entertains the notion that consciousness is a significant feature of the quantum level process of reality, although, for him, the evidence is not yet conclusive:

Nobody knows as yet where precisely (and in fact whether) consciousness may be located as the “ultimate observer system”. Without any novel empirical evidence there is no way to decide where a collapse really occurs...⁷⁰

However, it seems that Zeh leans towards the view that consciousness is significant at the quantum level, if this were not the

case one would have to say he is ridiculously inept in choosing the Greek quotes he uses to indicate his perspective, for, as alluded to previously, he has lyrically characterised his view by quoting the Greek philosopher Anaxagoras:

The things that are in a single world are not parted from one another, not cut away with an axe, neither the warm from the cold nor the cold from the warm. When Mind began to set things in motion, separation took place from each thing that was being moved, and all that Mind moved was separated.⁷¹

And, of course, this can only mean that: in the beginning was, not only the quantum wavefunction of potentiality, but also Mind, or primordial awareness-consciousness, a viewpoint that is completely in accord with the Buddhist Mind-Only perspective:

Those nonexistent phenomena do appear,
But neither from matter, nor from something other,
Nor from non-existence, ...
Therefore they have the very identity of consciousness.
It is taught that consciousness arises
As something that is the opposite of the nature of matter.
What is immaterial in nature
Is asserted here to be suitable as the very identity of
phenomena.
Space, earth, wind, sun,
The oceanside, and waterfalls
Are aspects of the true, internal consciousness
That appear as if being something external.
Since both subjects and objects appear as having the nature of
lucidity,
Their connection is not something hidden.
Since that which is aware is connected
To the objects to be aware of, it is aware of them....
Since clear appearances and mind have a connection
Of identity, the former are mere referents.
The nature of consciousness is real,
But aspects of perceiver and perceived are delusive and
mistaken.⁷²

In other words, it is the nondual quantum ground of primordial awareness, which has the nature of consciousness, which consti-

tutes a fundamental ground of the process of reality. Within this luminous ground of quantum awareness-potentiality, the multitudinous illusions (i.e. not 'real' in an ultimate sense) of perceiving beings and their perceptions takes place. This is the **Quantum Field of Sunyata**. And the existential configuration of this quantum field is:

**Its character is neither existent, nor non-existent,
Nor both existent and non-existent, nor neither.**

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