

# The Disappearing Material World, the Assassination of Consciousness in Helgoland, and the Sunyata-Emptiness Field

**In** the quantum-mystical gladiatorial intellectual contest mentioned in the last chapter, Harris makes the claim that Chopra is guilty of mistakenly equating two unconnected ‘mysteries’. Harris says that Chopra is assuming that:

... because quantum mechanics is spooky and difficult to understand and because what you are saying is spooky and difficult to understand, they must be mutually related, or mutually supported. This is fundamentally not true, they are arrived at by completely different methodologies, ways of thinking, and criteria of discursive evidence ...

The first point that should be noted about this observation is that it derives in its essential form from a remark made by the writer Daniel Dennett, who operates under the delusion that he is a philosopher, in his completely mistakenly titled book *Consciousness Explained*:

... 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.<sup>1</sup>

As we shall see in great detail later, this claim is completely false. As Rosenblum and Kuttner point out, there is dramatic evidence to

support the connection between quantum phenomena and consciousness:

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.<sup>2</sup>

Furthermore it is important to understand that it is only for materialists that consciousness is a mystery, for people who understand Buddhism correctly for example there is no mystery. Consciousness is the primary non-material energetic source of the process of reality which has a primary function of cognition. In its primordial nature it is non-dual, but because its internal functionality contains a divisive force of cognition, it divides into subject-object manifestation. The reason that materialists think that consciousness is a ‘mystery’ is that they are materialists, they think, as a matter of dogma, that matter is, ultimately, all there is to the universe.

Within Buddhist psycho-metaphysics, on the other hand, the pervasive view is that nondual awareness (*jnana*) and manifested dualistic consciousness (*vijnana*) are primary aspects of the functioning of reality. These two are obviously also interconnected, the undivided nondual ground awareness (*jnana*) manifests as manifested divided awareness (*vi-jnana*) which is individuated consciousness, the limited awareness operative within sentient beings. This division from the undivided realm of nondual awareness into the dualistic world of manifestation results from an internal karmic ‘pressure’, or immaterial ‘life-force’. Past intentional actions establish karmic seeds within the ground-consciousness that results in future manifestations. From this perspective, *vijnana*, or consciousness, operates as a ‘life force’ operating within a single lifetime and also across lifetimes. This ‘life force’ aspect of *vijnana*, consciousness, is referred to in the “Great Causes Discourse” (*Mahanidana Sutta*):

‘From consciousness as a requisite condition comes name-and-form.’ Thus it has been said. And this is the way to understand how from consciousness as a requisite condition comes name-and-form. If consciousness were not to descend

into the mother's womb, would name-and-form take shape in the womb?"

"No, lord."

"If, after descending into the womb, consciousness were to depart, would name-and-form be produced for this world?"

"No, lord."

"If the consciousness of the young boy or girl were to be cut off, would name-and-form ripen, grow, and reach maturity?"

"No, lord."

"Thus this is a cause, this is a reason, this is an origination, this is a requisite condition for name-and-form, i.e., consciousness."<sup>3</sup>

Thus we see that within the worldview of Buddhist psychometaphysics consciousness is considered to a primary life-force underlying the functioning of reality. We shall shortly see that quantum discoveries are in accord with this perspective.

In his book *From Reductionism to Creativity rDzogchen and the New Sciences of Mind* the Buddhist scholar and translator Herbert Guenther refers to the quantum physicist David Bohm's work in the context of the pre-Buddhist Dzogchen worldview. In the following we can identify Guenther's notion of the "inner dynamics of Being" as the inner force of cognition within Primordial Mind which forces manifestation precisely because of its inner nature of cognitive activity which is fundamental:

It is this ... inner dynamics of Being that eventually pushes it, figuratively speaking, over the instability threshold into its actuality so the virtually operative actuality in Being now assumes a true actuality that may be called Being's "eigenstate". This process is termed *gzhi-snang* which, borrowing a term coined by David Bohm, I render as "holomovement," which in the rDzogs-chen context means that Being in its totality (*gzhi*) lights up (*snang*), and in this lighting-up makes its presence felt. The implication is that, as paradoxical as it may sound, Being is nowhere else than in the what-is, ... this means that we are the whole and yet only part of it.<sup>4</sup>

It is the inner ‘pressure’ of the internal cognitive force that makes Primordial Awareness and quantum potentiality which constitutes ‘Being’ to “light-up” into subject-object manifestation. In this description the term ‘eigenstate’ is a technical term within quantum theory applying to the measurement process. The ‘eigenstates’ within quantum superpositions indicate states of possible manifestations.

Such a rich and appropriate understanding that the qualities of consciousness, which consist of clear empty internal luminosity with cognitive functionality, are primary and ultimately the most significant aspect of the process of reality, seems to lie beyond Dennett’s and Harris’s, and others of their persuasion, comprehension. This is why in their pronouncements the significance of consciousness is merely tossed aside as being an irritating aspect of matter mutely mattering away to itself!

After Sam Harris accuses Chopra of misidentifying ‘mysteries, he then goes on to claim that he, Sam Harris, has “hung out” with meditation masters who have spent years meditating in caves and none of them are interested in physics. When considering this latter statement one can only be dismayed at the level of deception in the service of gaining advantage in debates that Harris is sometimes willing to engage in. The fact that mystics emerging from caves have little interest in getting to grips with the latest physics textbook proves nothing about about whether there might be some sort of connection.

But it is not necessarily ask for someone who has spent years meditating in caves for an example of a serious representative of a spiritual tradition, with meditation experience, who was also interested in quantum physics, and saw a connection. One would have thought that the Dalai Lama might have been a pretty good candidate, someone whom Sam Harris must, of course, know about. And Harris would have to have been, himself, shut away in a deep cave not to know that the Dalai Lama is an enthusiastic proponent for the exploration of the apparent connections between the discoveries of quantum physics and the metaphysical knowledge gleaned through meditation experience and philosophical analysis within the Buddhist tradition.

The Dalai Lama has been instrumental in the set up and support of the the Mind and Life Conferences which are dedicated to this aim. In an article titled '*Dalai Lama Says Reality Is A Marriage Between Quantum Physics And Spirituality*', we read, for example, that the Dalai Lama said (in the following the 'Madhyamaka' is a type of Buddhist metaphysical philosophy):

... that quantum mechanics and spirituality can shake hands with each other on how they view the world. ... In his opening speech, His Holiness said he only became aware of the relationship between Madhyamaka and quantum physics after he had a conversation with the late Raja Ramanna, an Indian nuclear physicist. Ramanna told him that after reading the 2000-year old writings of the Madhyamaka philosopher Nagarjuna, he was surprised at how the philosopher's understanding of quantum physics matched his own.<sup>5</sup>

Indeed, the Dalai Lama has written a book on the subject of the possible connections, as he sees it, between science and Buddhist thought: *The Universe In A Single Atom*. So the notion, asserted by Harris, that all significant Buddhist meditators have no interest in quantum physics is false.

This is a strange oversight on Harris' part, for in an essay '*Killing the Buddha*' (2006) Harris clearly indicates he is aware of the interests of the Dalai Lama:

It is true that many exponents of Buddhism, most notably the Dalai Lama, have been remarkably willing to enrich (and even constrain) their view of the world through dialogue with modern science. But the fact that the Dalai Lama regularly meets with Western scientists to discuss the nature of the mind does not mean that Buddhism, or Tibetan Buddhism, or even the Dalai Lama's own lineage, is uncontaminated by religious dogmatism. Indeed, there are ideas within Buddhism that are so incredible as to render the dogma of the virgin birth plausible by comparison.<sup>6</sup>

Whether spending long periods in caves has a counteractive influence on such an interest, so that retreating into a cave for long periods to experience the deep levels of primordial mind entirely

erases interest in such scientific-philosophical insights, is another issue; but, I would have thought, this is highly unlikely. It is true that most Buddhist meditators have no interest in learning how to manipulate and solve quantum mathematical equations, but this does not mean they are entirely disinterested in the metaphysical implications of quantum physics.

The significant Buddhist Dzogchen teacher Tulku Urgyen Rinpoche was one of Harris' teachers. I can find no evidence that Urgyen Rinpoche had any interest in physics, but he died in 1996, so the main part of his life spanned a period when connections between quantum theory and Eastern thought were not widely disseminated. The early explorations in this area were the books *The Tao of Physics: An Exploration of the Parallels between Modern Physics and Eastern Mysticism* by Fritjov Capra, published in 1975, and *Dancing Wu Li Masters: An Overview of the New Physics* by Gary Zukav, published in 1979. It is unlikely these works would have had a significant impact upon a traditional Dzogchen practitioner-teacher such as Tulku Urgyen Rinpoche at that time.

However, subsequently the evidence for connections, and explorations concerning quantum physics and Eastern mystical worldviews have become far more prevalent and widely known, so much so that Tulku Urgyen Rinpoche's son, Yongey Mingyur Rinpoche, also a Dzogchen practitioner-teacher, has noted that, as he sees it, there are significant connections. He notes that:

I've been struck by a number of similarities between the principles of quantum mechanics and the Buddhist understanding of the relationship between emptiness and appearance.<sup>7</sup>

Now this remark takes us straight back to Harris' confident assertion that apparent conclusions that derive from "completely different methodologies, ways of thinking, and criteria of discursive evidence", and it is clear that Harris thinks that the worldviews of quantum physics and Buddhist philosophy are examples which apply here, cannot be significantly related or mutually supportive, they cannot really and truly support or point to the same conclusion. But, it seems that Yongey Mingyur Rinpoche disagrees, which indicates that Harris's confident claim is perhaps on shaky

ground.

Presumably Harris thinks that the supposedly similar conclusions, the Buddhist/Hindu view of the primacy of consciousness and the discovery of the functioning of consciousness at the quantum level, arrived at by different means, can only appear to be similar to the to the uninitiated, to people ignorant of the true nature of the fields of research concerned. Harris must think that to more discerning and insightful intellects, presumably such as that possessed by Harris and Shermer, such seemingly parallel conclusions can easily be seen to be not the same conclusions at all! They may look for all the world to be saying exactly the same thing, but the superior materialist intellect possessed by Harris, within which the mind-generating little bits of mindless material ‘stuff’ vibrate and pulse in more exact trajectories to those of the less insightful human beings, sees the truth of the mindless origin of mind.

But this assertion by Harris arrogantly rules out the views of the Dalai Lama, Yongey Mingyur Rinpoche and many other significant physicists, philosophers, and practitioners such as B. Alan Wallace, who, at the same time as being an advanced meditation practitioner, “obtained a B.A. in physics, philosophy of science and Sanskrit from Amherst College, followed in 1995 by a PhD. in religious studies from Stanford University”<sup>8</sup> and has written books such as *Hidden Dimensions* concerning the interface of science and Buddhism, or the important physicist David Bohm who indicated deep interconnections, or the physicist and Tibetan Buddhist practitioner Victor Mansfield, who in his book *Tibetan Buddhism and Modern Physics*, wrote:

We can now demonstrate that ‘quantum moons’ do not exist when unobserved. Such ‘experimental metaphysics’ has an extraordinary resonance with the Middle Way Buddhist principle of emptiness...<sup>9</sup>

The term ‘quantum moons’ refers to quantum particles in quantum experiments which show that particles only exist when observed. The term derives from an occasion when Einstein was asked whether the moon existed when it was not observed. It turns out that, according to some physicists:

...even an object as large as the Moon, full of atoms held together by gravity and jiggling about with the random thermal motion appropriate to its temperature, does not exist when nobody is looking at it. ... The Moon doesn't simply disappear when nobody is looking at it ... The probability waves spread out very slowly, from the states they were in when they were last observed; the whole moon begins to dissolve away into a quantum ghost. But because the Moon is so big the process is very slow. It doesn't take a few nanoseconds but millions (perhaps billions) of years for the Moon to dissolve away into quantum uncertainty.<sup>10</sup>

Which is reassuring!

The Mansfield 'quantum moon' quote, refers to the "Buddhist principle of emptiness". An initial, simple way of comprehending the "Buddhist understanding of the relationship between emptiness and appearance" is to appreciate the Buddhist view, established very early in the Buddhist philosophical tradition, that although the material world has the 'appearance' of being solid, it is in fact 'empty' of significant internal solidity, if, that is, we mean by the term 'solidity' an internal continuous non-interrupted stream of material 'stuff'. Buddhist thought was aware early on that 'matter' has internal structure and is to a large degree 'empty' of 'stuff'. The world is comprised of a network of interconnected fleeting appearances. And, furthermore there are imputational relationships between consciousness and those appearances, which produce the appearances of an apparently external 'solid' material world and an internal 'mental' world.

This Buddhist view was based on similar philosophical-theoretical analyses to those carried out by pre-quantum physicists, a point which clearly indicates the falsity of Harris's claim that conclusions reached in the different arenas are based on entirely different conceptual processes. The crucial difference in twentieth century physics lies in the extraordinary experimental wizardry which allows a remarkable confirmation of conclusions reached by various conceptual analyses. So, although it is a fact that Buddhism, and other Eastern philosophical traditions, did not develop means of precise scientific testing and confirmation, this does not mean that their philosophical-conceptual modes of

analysis are completely different. Because of this, it is entirely natural and appropriate for a Buddhist practitioner-philosopher to note that certain Buddhist doctrines have been replicated and validated by Western science. This is not say that Buddhist insights need such validation, but it does add a dimension of deeper understanding and credibility.

Many physicists prior to 1900 and shortly thereafter thought that matter actually was ‘solid’, having no ‘real’ internal structure. Planck, for instance, thought that ‘matter’ was continuous, and Dirac around 1918 considered atoms as being ‘very hypothetical things’.<sup>11</sup> The scientist Sir Oliver Lodge stated in 1912, for instance, that:

Although the atomic theory of chemistry has held its own, and although chemists have tried to picture to themselves the kind of atomic arrangement or grouping that would account for the observed properties of molecules - among other things for their crystalline interlockings and angular facets - yet chemists have always been careful to say that these pictorial representations were not to be taken literally or supposed to correspond with actual fact, but that they are to be treated in more or less metaphorical or allegorical manner rather than as statements of reality. Indeed the tendency was to doubt whether the actual *fact* of such arrangements could ever be perceived; and a good deal of scepticism persisted in the minds of at least a few chemists as to whether ‘atoms of matter’ were more than a convenient verbal expression.<sup>12</sup>

If you stop to think about this carefully, it is an extraordinary statement. The nineteenth century had seen advances in understanding chemical processes due to John Dalton’s atomic chemistry as he published it in 1808, which indicated that chemical processes must be due to an underlying atomic structure, along with rules of atomic combination, and yet it is also the case that in the late nineteenth century and very early twentieth century that:

Some chemists were reluctant to assert that the structures were in fact depictions of the physical arrangements of atoms in space, ... There were eminent scientists ... who, whilst accepting that the phenomena were indicative of

some underlying structure, refused to make the further assumption that the formulae with their structures referred to arrangements of atoms at all.<sup>13</sup>

So at the end of the nineteenth century and beginning of the twentieth century many scientists, including physicists, thought that matter was much more ‘solidly’ material than we now know it to be, many seemed to think atoms were just fictional ‘hypothetical’ mathematical convenient ideas which were not ‘real’.

When we consider that at the end of the nineteenth century many physicists did not consider atoms to be ‘real’ entities and that matter was perhaps continuously solid, the reasoning by which Buddhist philosophers argued against this conclusion is remarkable. The reasoning is completely clear and insightful when comprehended, furthermore this reasoning is in no way dramatically different, as Harris claims it should be, to general scientific-theoretic reasoning. Here is the reasoning offered the 5th century Buddhist philosopher-practitioner Vasubandhu:

The change that these conditioned phenomena undergo over time is reasonable only if they are subject to a form of disintegration in which they arise and pass away with each moment; this phenomena is not reasonable if entities remained in an unchanging state.<sup>14</sup>

In other words, if material entities were solidly continuous – with no internal structure – they simply could not deteriorate over time in the manner that they actually do, every part of the interior would be as inviolably resilient as the rest, and there would be no weak point for any disintegration to get started. We know, for example, that water constantly dripping on to a rock surface will, over time, gradually wear it away and create a groove. Such deterioration would not be possible without some kind of internal structure, which allowed weak start points. One can only wonder why such a reasoning process did not occur to late nineteenth century physicists!

In the *Phena Sutta* the Buddha disclosed the ‘emptiness’, or the lack of inherent, real, substantial nature in all phenomena. The following descriptions contain insights which became central

within the explorations of later Mahayana ('Great Vehicle') metaphysical analysis:

Form is like a glob of foam; feeling, a bubble; perception, a mirage; [mental formations], a banana tree; consciousness, a magic trick .... However you observe them, appropriately examine them, they're empty, void to whoever sees them appropriately. Beginning with the body as taught by the One with profound discernment: when abandoned by three things — life, warmth, & consciousness — form is rejected, cast aside. When bereft of these it lies thrown away, senseless, a meal for others. That's the way it goes: it's a magic trick, an idiot's babbling. ... No substance here is found.

In this Sutta the Buddha does not hold back any metaphorical punches as he presses home the point that all phenomena, including those which appear real, solid and substantial, are in fact empty, void, and without significant internal substance:

Monks, suppose that a large glob of foam were floating down this Ganges River, and a man with good eyesight were to see it, observe it, & appropriately examine it. To him — seeing it, observing it, & appropriately examining it — it would appear empty, void, without substance: for what substance would there be in a glob of foam?

And:

Now suppose that in the autumn — when it's raining in fat, heavy drops — a water bubble were to appear & disappear on the water, and a man with good eyesight were to see it, observe it, & appropriately examine it. To him — seeing it, observing it, & appropriately examining it — it would appear empty, void, without substance: for what substance would there be in a water bubble?

And:

Now suppose that in the last month of the hot season a mirage were shimmering, ... — it would appear empty, void, without substance: for what substance would there be in a mirage?

And, the following relies on knowledge of the fact that banana trees are hollow:

Now suppose that a man desiring heartwood, in quest of heartwood, seeking heartwood, were to go into a forest carrying a sharp axe. There he would see a large banana tree: straight, young, of enormous height. He would cut it at the root and, having cut it at the root, would chop off the top. Having chopped off the top, he would peel away the outer skin. Peeling away the outer skin, he wouldn't even find sapwood, to say nothing of heartwood. ... — it would appear empty, void, without substance: for what substance would there be in a banana tree?

And:

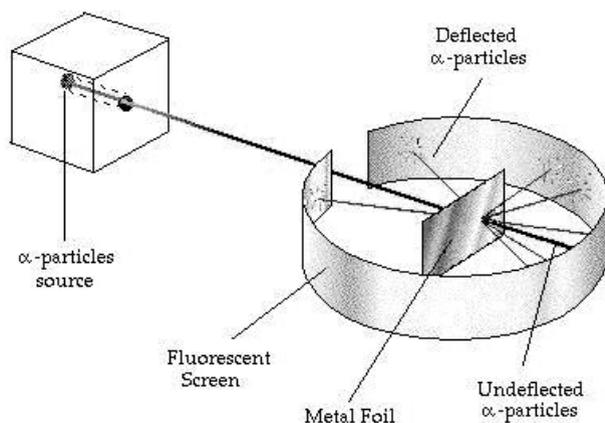
Now suppose that a magician or magician's apprentice were to display a magic trick at a major intersection, ... — it would appear empty, void, without substance: for what substance would there be in a magic trick?

In these descriptions Buddha was directly addressing the nature of the material and mental worlds. All conditioned phenomena are empty of any 'real' substantial nature. He may have been disclosing these insights in order to encourage his followers towards spiritual practice, but this does not make these insights into the actual nature of all phenomena, including the material world, different to those disclosed to modern science through the experimental method. The entire apparently material world is an insubstantial mirage generated from immaterial quantum fields.

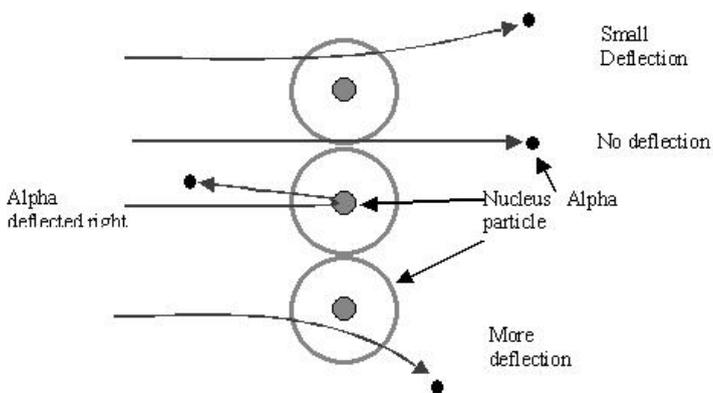
The fact that matter was not continuously solid, but had some kind of internal atomic structure was suggested by the discovery of alpha particles (2 protons & 2 neutrons) and beta particles (electrons). In 1887 the great experimental physicist J.J. Thomson showed that the mysterious rays known as 'beta' rays were actually made up of streams of particles carrying a negative electric charge, these were subsequently called electrons. On the basis of his work Thomson proposed one of the first models of the atom, referred to as the 'plumb pudding model'. This picture of the atom consisted of a ball of positive charge with smaller balls of negative charge, the electrons, embedded within the larger ball, like plums in a pudding.



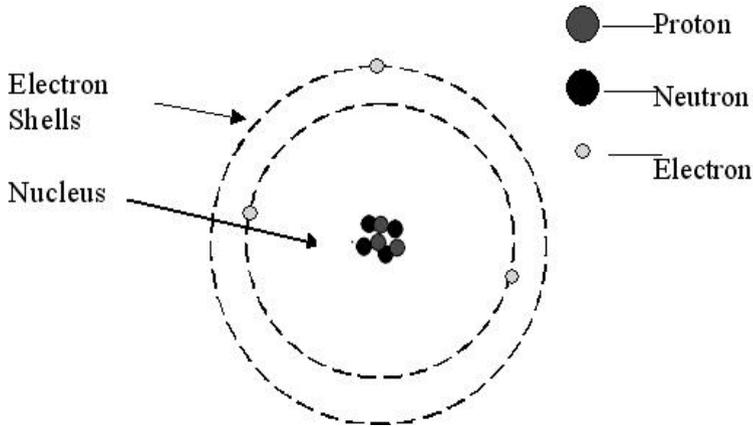
stalls. The distances in the schematic image and its scale is very misleading – the electrons are much, much smaller than protons and neutrons (nucleons) and the distance between the nucleus and electrons much greater. As previously stated, but worth stating again, atoms, and therefore what appears to be a ‘solid’ material reality, are really almost completely devoid of substance, there is almost nothing there! One might say that all material phenomena hover on the edge of existence!



Alpha particle deflections.



Very few of the alpha particles were deflected ...



Schematic image of atomic structure with misleading scale.

All phenomena are devoid of internal continuous ‘solidity’, which in Buddhist terms means they lack *svabhava* - ‘inherent existence’ - they are devoid of independent internal self-existence, devoid of internal separate solidity. Despite this, however, all unenlightened sentient beings experience phenomena as if they did have *svabhava*. This is the way that just about all human beings experience and apprehend the entities of the apparently material world. The material world seems to exist ‘out there’, made up of solid stuff. But this is a false appearance.

If a person is drinking from a cup it is unlikely that they experience and apprehend the cup as a hologram projected from an immaterial higher realm. They almost certainly experience the cup as an entity with its own internal mass, weight, solidity and identity, the cup is experienced as having its own *svabhava*, own-being, inherent-existence. This is the way that most unenlightened beings engage with the everyday world. And, of course, for conventional everyday activities such a manner of engaging with the everyday world is effective and adequate for everyday purposes. Perhaps engaging with everyday phenomena as spiritual holograms would, for most people, be distracting.

In this context there is an amusing observation made by the Buddhist writer John D. Dunne, in his book on the Buddhist

philosopher Dharmakirti. Some early Buddhist schools of thought considered that the ultimate constituents of reality must be ‘infinitesimal particles’ which only had momentary existences. These Buddhist philosophers pursued the issue of what this would mean for their notions of ‘reality’. From this model of reality, which is analogous to the situation of atomic theory of early twentieth century physics, objects of everyday world with which we are familiar cannot be considered to be ‘ultimately real’ precisely because they can be decomposed into the constituent particles which are, on this view, ‘ultimate’. And these ‘ultimate’ particles are ‘ultimate’ precisely because they cannot, from this atomic viewpoint, be decomposed into smaller entities. Of course, we now know that this is not true, but we are conducting a philosophical analysis from the basis of taking this as a provisional truth adopted by a school of Buddhism.

If this were to be the way that the process of reality is constructed then such ultimate particles would have to have their own internal, self-existing *svabhava*, independent substantial existence. In this case, according to the analysis of the Buddhist philosopher Dharmakirti:

... a term such as “water jug” is simply a linguistic convention employed as a convenient means to indirectly express multiple infinitesimal particles that, due to their proximity, causally support each other such that they together perform functions that are of interest to us.<sup>15</sup>

But, as Dunne says:

When we are thirsty, certainly it is easier to say, “Bring the water jug,” than it is to say, “Bring some mutually supporting infinitesimal particles that, through their causal support, serve the functions associated with the concept ‘water jug.’”<sup>16</sup>

This indicates that when we are engaged in the actions and concerns of everyday life, awareness of the ultimate nature of the entities surrounding us does not seem relevant, and therefore our language concerning the everyday world consistently endorses, supports and reinforces the appearance of an independent ‘solid’ and ‘real’ external material reality. However, in reality, reality hovers on the edge of reality.

This leads us towards the Buddhist metaphysical realm of *sunyata*, emptiness, the lack of inherent substantial nature in all phenomena. According to the Mahayana Buddhist *Heart Sutra (Maha Prajna Paramita Hridaya Sutra)*:

Form is emptiness and that very emptiness is form;  
emptiness does not differ from form, form does not differ  
from emptiness, whatever is emptiness, that is form,  
the same is true of feelings, perceptions, impulses, and  
consciousness.

...

all things are marked with emptiness ;  
they are not produced or stopped, not defiled or  
immaculate, not deficient or complete.

Therefore, ...

in emptiness there is no form nor feeling, nor perception,  
nor impulse, nor consciousness ;

No eye, ear, nose, tongue, body, mind ; No forms, sounds,  
smells, tastes, touchables or objects of mind ; No sight-  
organ element, and so forth, until we come to:

No mind-consciousness element ; There is no ignorance,  
no extinction of ignorance, and so forth, until we come to :  
There is no decay and death, no extinction of decay and  
death. There is no suffering, no origination, no stopping,  
no path.

There is no cognition, no attainment and no non-  
attainment.<sup>17</sup>

Many people find this view of the essential ultimate non-existence (almost) of all things (*'dharma's'* in Sanskrit) disturbing. The Buddhist scholar-practitioner Karl Brunnhölzl gave his translation and commentary to this Sutra the title *The Heart Attack Sutra* precisely because several of the Buddha's followers are said to have suffered heart attacks when they first heard its assertion of the basic groundlessness of reality and existence. However, it is important to bear in mind that when this Sutra tells us that there is "no eye, ear, nose, tongue, body, mind" it is asserting that these apparent features of reality are not *substantially* existing, they do

not ‘exist’ substantially with significant internal solidity as they appear to do. In reality they are more akin to illusions, or mirages, holographic images even. There is an appearance of reality and existence, but it is not what it seems.

In the Madhyamaka, or the ‘Emptiness Middle Way’, school of Tibetan Buddhist metaphysics the technical term *svabhava*, or ‘inherent existence’ (sva-bhava = own-being), is used to indicate this missing aspect of reality, the missing internal solidity. According to the Madhyamaka, all phenomena lack *svabhava*, phenomena do not have inherent existence, they do not have internal ‘own-being’. When the elements of the everyday world are rigorously analyzed they are found to lack a solid inner core or essence. Indeed, modern physics has discovered that even atoms are more than 99% empty space.

According to the view of the Madhyamaka there is a mistaken attribution of an inherent, independent ‘inherent existence’ and ‘own-nature’ built into the very process of perception. This means that the idea of objects existing in their own right is instinctively superimposed on all everyday experiences. There is, in other words, a mistake built into the very heart of perception; objects which in reality are ‘empty’ of inherent existence are routinely experienced as if they were inherently existent. According to Buddhist thought this mistaken mode of perception is very deep within the process of reality; it is in fact the mechanism which actually creates an illusion of an experientially dualistic world consisting of perceiving subjects and perceived objects.

In his recent book *Cosmological Koans: A Journey to the Heart of Physics*, the physicist Professor Anthony Aguirre (cofounder of the Foundational Questions Institute<sup>18</sup>) discusses the Heart Sutra ‘form is emptiness; emptiness is form’ perspective as follows:

...is “real”: made of atoms, or elementary particles?

Yet, what is an elementary particle? As Stephen Weinberg, a titan of particle physics, admits; ... “I would have to admit that no one really knows.” ... an atom acts just like a particle .... until you look very closely at it, and see that it is an arrangement of protons, neutrons, and electrons. A

proton is a particle until you probe it further and discover it is composed of quarks.

What is an electron? We almost irresistibly want to think it is a little bit of substance. But, it isn't. The most sophisticated particle-physics account is that an electron is an excitation of the *electron field*, which pervades space-time. ... If you ask what the nature of an electron fields is, the answer is this: An electron field is *an entity able to create and destroy electrons!* This is a rather displeasingly circular response.

So then we regroup and ask again: "What is an electron?" Another answer is mathematical; it is an object defined by a particular set of mathematical "symmetries" ...

There is no way to "get at" an electron other than to ask questions whose answers identify it as an electron. Quantum theory strongly suggests there is nothing *beyond* the quantum state - nothing that the quantum state is *missing*, no *substance* that it is describing. ...

Thus we arrive at a strange place. We break things down into smaller and smaller pieces, but then the pieces, when examined, are not there. ...

If things are forms of forms of forms of forms, and if forms are order, and order is defined by us (who define macro-states) and by history (which actualizes them) and by the Universe (which undergirds the order), then those forms, it would seem, do not exist of themselves. They exist, it would appear, only as created by, and *in relation to*, us and the Universe. They are the Buddha might say, emptiness.<sup>19</sup>

Here we see that Aguirre (who is a physicist! - take note Sam Harris) identifies quantum fields with the Buddhist concept of emptiness.

Carlo Rovelli is another physicist who has recently made a philosophical excursion into the field of Buddhist emptiness metaphysics. In his book *Helgoland* Rovelli quotes the passage from Aguirre cited immediately above. Rovelli then observes that:

The solidity of the world to which we have become accustomed to in our daily lives does not reflect the actual grain of reality: it is a result of our macroscopic vision.<sup>20</sup>

And then quotes Schrödinger:

...it is better to consider a particle not as a permanent entity but rather as an instantaneous event. Sometimes these events form chains to give the illusion of being permanent, but only in particular circumstances and only for an extremely brief period of time in each individual case.<sup>21</sup>

Rovelli devotes one of his chapters to the Buddhist emptiness philosopher Nagarjuna, and he explores the relationship between the Buddhist notion of emptiness and the modern discoveries of quantum physics. In particular, Rovelli is a proponent of a 'relational' view of quantum theory, which he thinks is close to the 'emptiness' revealed by Nagarjuna. However, as we shall see, he does not fully comprehend the emptiness teachings of Nagarjuna.

Rovelli is yet another example of a physicist indulging a penchant for philosophy who assumes at the outset of his explorations that there is nothing particularly special about consciousness. For Rovelli, consciousness cannot be, because he does not want it to be, a fundamental aspect of the process of reality. Quantum physics may have revealed just how weird and unexpected the familiar world is; but it cannot, as a matter of dogma, for Rovelli, be so weird that consciousness is an aspect of the world which is of primary significance!

The deep quantum conundrum is revealed in a mystical tone at the outset of Rovelli's book in the first chapter 'Looking into the Abyss'. Rovelli is taking a break from a physics conference, musing on the nature of reality with another physicist:

We have ended up basically agreeing. On the beach there is a long silence. We watch the sea. "It's really incredible", Caslav whispers. Can we believe this? It's as if reality ... didn't exist ..."<sup>22</sup>

So we are clearly in the realm of a discovery of missing substance, which maps into the realm of Buddhist emptiness. But the way in which Rovelli works his way towards Nagarjuna's view of

emptiness is curious, and yet at the same time familiar to the way in which some other physicists, such as Carroll, have just discounted the significance of consciousness on dogmatic grounds.

The early chapters of Rovelli's book focus on the fact that, within the quantum situation, the manifestation of an experienced 'reality' seems to be connected to the act of 'observation'. As Rovelli points out, the quantum probability wave-equation:

...evolves in time according to the equation written by Schrödinger, *as long as we do not look at it*. When we look at it, pttf!, it disappears, concentrated into a point, and we see the particle there. As if the mere fact of observing it was enough to modify reality.<sup>23</sup>

Here Rovelli describes the collapse of the quantum wavefunction, which occurs when the wavefunction is 'observed', an act which requires consciousness, and which seemingly causes a transition from wave to particle. And Rovelli also tells us that:

...the theory doesn't tell us where to find any one particle of matter when we are not looking at it. It only speaks about the probability of finding it at one point if we observe it. But, again, what does a particle care if we are observing it or not?<sup>24</sup>

And here we find an example of Rovelli's conceptual and linguistic underhandedness. Of course, it is an absurd notion that quantum level particles 'care' whether they are being observed or not, but this is entirely irrelevant to the fact that there is this apparent mechanism operating at the quantum level.

So why does Rovelli talk about the silly notion that particles might 'care' about being 'observed'? Well, its not rocket science, nor quantum mechanics level difficulty, to comprehend the reason. Rovelli is implying that if someone does believe that consciousness is involved in producing a 'collapse of the wavefunction' as several significant physicists do, then they must be silly enough to think that particles have emotions. As we have seen, there are some New Age Propheteers who do propose ideas close to this absurdity, such as Paul Levy, who claims that electrons 'dream up' physicists to observe those very electrons into existence! But not everyone who takes such a view of consciousness-interaction

wavefunction collapse would take such an absurd view of the situation, believing that particles were fully sentient! Rovelli is engaging in an intellectual smear campaign here. And it is an intellectual smear campaign which Rovelli employs as a central tactic:

Once again, we are back with what can be ‘observed’. And, once again, this raises the question: what does nature know or care about whether we are observing it or not?<sup>25</sup>

And:

Observable? What does nature care whether there is anyone to observe or not?<sup>26</sup>

Again, it is necessary to emphasize, whether nature might ‘care’ or not, which is clearly an absurd notion, is entirely irrelevant to whether the mechanism occurs or not.

It is clear that Rovelli is not happy with notions that observation, an activity which generally would be taken to involve consciousness, could have anything to do with ‘nature’. According to Rovelli, as a dogmatic point of departure, observation or consciousness cannot be an integral and fundamental aspect of the workings of ‘nature’. Nature does not care enough!

Rovelli explains his views on this issue with reference to the quantum ‘interpretation’ which is called ‘QBism’, which suggests that the probabilities of quantum physics must not be thought to relate to something ‘real’, or even perhaps ‘semi-real’, existing in some way ‘out there’. According to Rovelli:

QBism abandons a realistic image of the world, beyond what we can see or measure. ... QBism holds a dramatically instrumental conception of science: the theory gives predictions only about what the subject can see ...<sup>27</sup>

And then Rovelli states, a statement worth noting because of a future complete contradiction on the part of Rovelli, a few pages later in his own book:

I think that science is not just about making predictions. It also provides us with a vision of reality ...<sup>28</sup>

And, a couple of paragraphs later we read:

I want a theory of physics that accounts for the structure of the universe, that clarifies what it is to be an observer in the universe, not a theory that makes the universe depend on me observing it.<sup>29</sup>

It is intriguing to note here that Rovelli tells us what he ‘wants’, rather than announcing his scientific determination to reach valid conclusions which are the most consistent with the evidence. Surely this is *not* a correct scientific attitude! Furthermore it is important to also note that a central feature of Rovelli’s ‘wants’ is the elimination of any dependence of the universe upon ‘observers’. This clearly indicates that, for Rovelli, a dependence upon consciousness is definitely not ‘wanted’. It is clear, then, that Rovelli is controlled by, or is perhaps a paid-up member of, the anti-quantum-mystical thought police!

One of the disturbing aspects of reading Rovelli’s book is the seeming philosophical deception that one encounters along the way. This tendency is clearly revealed in the fact that even after Rovelli has indicated that it is his intention to banish the role of ‘observation’ from his view of the process of reality, he still employs language which requires its presence, as well as the presence of consciousness to enable the functioning of such ‘observation’, or, to use Rovelli’s revised terminology, ‘interaction’ or ‘manifestation’. Thus, although Rovelli has just told us that ‘observation’ is not anything special or important in the process of reality, he still underhandedly, and subtly, assumes its significance, even as he develops his ‘relational’ interpretation of quantum theory, which is supposed to eliminate such special ‘observations’ from the picture. In the ‘relational’ picture of quantum theory, every element and aspect of reality has relations and interactions with other elements or aspects of reality, and there is nothing special about biological organisms who might like to think, in their, on Rovelli’s view, hubris, that they had access to a special aspect of reality which makes them to be ‘observers’.

To facilitate this sleight of mind, Rovelli uses an intellectually underhanded sleight of word, Rovelli just replaces the word ‘observes’ with the word ‘manifests’, and ‘observation’ becomes ‘manifestation’. Thus, he writes:

What is an observation, when there is no scientist observing?  
What does quantum theory tell us, when there is no one  
measuring?... scientists ... and their measuring instruments  
are all part of nature. What quantum theory describes, then,  
*is the way in which one part of nature manifests itself to  
any other single part of nature.*<sup>30</sup>

In modifying, and prescribing, word usage in this way Rovelli manages to make the phenomena of consciousness, which for non-materialist physicists / philosophers is considered to be a fundamental aspect of reality, disappear into the void between the words, so to speak. It is important to comprehend that mind and consciousness has been assassinated by intellectual stealth from Rovelli's relational universe. Everything relates and manifests to everything else, so there is no way there can be any special entities which have a kind of extra awareness of, or knowing about, relations or manifestations. Everything just carries on mutely manifesting without a care!

It is also vitally important to be aware that what Rovelli is involved in is little more than an intellectual confidence trick which is carried out with a judicious, or injudicious depending upon one's point of view, use of perspective, created by choice of words:

At the heart of the 'relational' interpretation of quantum theory is the idea that the theory does not describe the way in which quantum objects manifest *to us* (or to special entities that do something special called 'observing'). It describes how every physical object manifests itself to any other physical object. How any physical entity acts on *any* other physical entity. We think in terms of objects, things, entities (in physics, we call them 'physical systems'): a photon, a car, a stone, a clock, a tree, a boy, a village, a rainbow, a planet, a cluster of galaxies ... These do not exist in splendid isolation. On the contrary, they do nothing but continuously act upon each other. To understand nature, we must focus on these interactions... The world that we observe is continuously interacting. It is a dense web of *interactions*.<sup>31</sup>

But does not a rainbow require something extra? An awareness of the colour? A rainbow does not exist, 'out there' in the same way a stone does. Most readers however, will not notice the deception.

Although Rovelli uses the word 'observe' towards the end of this passage, it is just an example of his philosophical incompetence, or deception, for he has just told us, at the beginning of the passage, that, ultimately, there are no "special entities that do something special called 'observing'". If Rovelli were to be completely true to his vision, which requires that an 'observation' is merely an 'interaction', he should have written as the final two sentences in this passage, replacing the word 'observe' with the phrase 'interact with':

The world we interact with is continuously interacting. It is a dense web of interactions.

But it is clear that replacing the word 'observe' with the phrase 'interact with' changes the meaning significantly, for there is no implication of conscious awareness being a significant aspect of the situation when the replacement is made. The word 'observe' contains the implication of the presence of conscious awareness. Conscious awareness is a necessary ingredient of 'observations', but it is not required for a mere 'network of interactions'. But the sentence which results when the replacement is made is almost a meaningless tautology. So Rovelli is forced to use the word 'observe', a word he has previously told us it not necessary, because it is just an interaction or manifestation.

So, in Rovelli's 'relational' universe, mind is not required, although on occasion it is necessary to use the word 'observe' to make sentences sound right:

The mind does not enter into the equation. Special 'observers' have no real role to play in the theory.<sup>32</sup>

It is clear that Rovelli is removing the primacy of mind, and the fundamental necessity of consciousness from his picture of reality. He clearly states that there are no 'special' 'observers' in his sparse 'relational' physics, there are only 'physical' 'relationships' or 'interactions', or 'manifestations'.

However, what ‘physical’ bits and pieces are actually at either end of the vast ‘network of interactions’ is never clearly specified; we are given a list of examples of ‘physical systems’ in Rovelli’s ‘relational’ universe: “a photon, a cat, a stone, a clock, a tree, a boy, a village, a rainbow, a planet, a cluster of galaxies... continuously act upon each other.”<sup>33</sup> But, beyond vague claims such as this, there is no convincing evidence, nor, in fact, any precise evidence or reasoning provided by Rovelli as to what exists at either end of the relationships, it is all smoke and mirrors, and linguistic deception which unwary readers, which seems to be just about everyone, falls for. One writer describes Rovelli’s view as that: “things (or objects) seem to be eliminated from the scene”<sup>34</sup>. But if things are “eliminated from the scene”, how come we get a list of ‘things’: “a photon, a cat, a stone .....”. Surely it is not the case that, at the same time as Rovelli appeals to the existence of ‘things’ in order to claim the ultimate existence of ‘relationships’, these very relationships lead to the complete disappearance of the ‘things’ that the relationships rely upon for their existence!

It is astonishing that anyone with a clearly reasoning mind takes any of the philosophical content of Rovelli’s claims seriously, for, when closely analysed it is nothing other than sophistry, or word-deception. Perhaps the reason that it is taken seriously is because when it is *not* analysed too closely it does sound quite cool, groovy, and kind of Eastern-mystical sounding, when one ignores the assassination of consciousness. In particular, it does sound very similar to the insights of Nagarjuna, the foundational, or perhaps we should say ‘lack of foundation’, philosopher of the Buddhist *Madhyamaka* metaphysical school. But, as we shall see, the comparison with Nagarjuna is also deceptive!

By word-deception I refer to the often employed tactic of using words which seem on the surface to say something that you wish to be true, and many others also wish to true, and on the surface the words do indeed seem to provide a plausible account of reality functioning in the manner that one, and others, might wish it to function; but when the claims are subjected to rigorous analysis they dissolve into empty, in the non-Buddhist sense of the term, vacuity. Such employment of a conceptual network of deception is an example of what Wittgenstein called a ‘language game’, a mode of speaking and communication which is employed for social

interaction which does not necessarily hook directly into reality but has social value. Of course, many language games serve a legitimate purpose; in science however, we expect the language games to hook efficiently into the actual functioning of reality, and this should apply even when physicists switch into philosophical mode.

Most ‘interpretations’ are actually such ‘language games’ which are employed for ideological-philosophical agendas, perhaps sometimes promoted for academic fame and fortune; for a new ‘interpretation’ is certainly a way of getting one’s name ‘out there’. Heisenberg suspected there was an ideological agenda behind David Bohm’s 1952 ‘hidden variables’ ‘interpretation’, wherein ‘real’ hidden waves pushed ‘real’ quantum bits and pieces around the universe. Heisenberg wrote of Bohm’s proposal, in an essay ‘Criticisms and Counterproposals to the Copenhagen Interpretation of Quantum Theory’, as follows:

When one analyses the papers of ... [those who do not “want to change the Copenhagen interpretation so far as predictions of experimental results are concerned”, but try “to change the language of this interpretation in order to get a closer resemblance to classical physics”] it is important to realize from the beginning that their interpretations cannot be refuted by experiment, since they only repeat the Copenhagen interpretation in a different language. .... This objective description ... reveals itself as an ‘ideological superstructure’, which has little to do with immediate physical reality ...<sup>35</sup>

In the case of Bohm’s 1952 ‘hidden variables’, or ‘pilot-wave’ account of quantum physics, the idea was to produce ‘a closer resemblance to classical physics’, for Bohm had been inspired by Einstein to create a more classical-seeming view of quantum functioning. In order to do this Bohm had produced a picture of ‘real’ particles being guided around by ‘real’ quantum waves. But there were significant problems with Bohm’s attempt, and he later developed his initial view into a much more ‘mystical’ quantum metaphysics which embraced a view of consciousness as a fundamental aspect of reality.

This was a significant intellectual development, for when one studies Bohm’s intellectual journey carefully, as I have done in my

last book *The Tibetan Book of the Undivided Universe: David Bohm's Quantum Philosophy of Wholeness in the Light of Buddhist Metaphysics*, it becomes clear that any attempt to exclude consciousness as a fundamental aspect of reality only creates an internal incoherence which must be either addressed with integrity, or pasted over through word-deception, or obfuscation. As the important quantum physicist and philosopher Henry Stapp has pointed out:

...the re-bonding [between mind and matter] achieved by physicists during the first half of the twentieth century must be seen as a momentous development: a lifting of the veil. Ignoring this huge and enormously pertinent development in basic science, and proclaiming the validity of materialism on the basis of an inapplicable-in-this-context nineteenth century science is an irrational act.<sup>36</sup>

Bohm chose the path of rationality!

In the case of Rovelli's 'ideological' agenda, one important aspect is clearly the removal of mind and consciousness as a significant feature of the process of reality. Thus, in the Stanford Encyclopedia of Philosophy account of 'Relational Quantum Physics' (RQM), written by Rovelli with another physicist, we read:

RQM can make sense of a fully quantum world without requiring hidden variables, many worlds, physical collapse mechanisms, or a special role for mind, consciousness, subjectivity, agents, or similar.<sup>37</sup>

And Rovelli's unsupported view that mind is nothing beyond the 'physical' is reiterated in his book *Helgoland*:

To ask what consciousness is, after having unravelled the neural processes, is like asking what a storm is after having understood the physics; it is a question that makes no sense.<sup>38</sup>

So the message is clear, consciousness is nothing beyond the 'relationships' which are presumably operating, according to Rovelli's 'relational' view, within the functioning of "neural processes". But it is strange that Rovelli can be so assured of his reductive view, for, like Sean Carroll, he is aware that there is still a

significant amount that is not known about the functioning of the brain:

Neuroscience is making remarkable progress in understanding the functioning of our brain. Most of its working will probably be clarified sooner or later.<sup>39</sup>

But this means we do not fully understand the functioning of the brain right now. So how can Rovelli be sure about the ‘physical’, ‘relational’ nature of the illusory appearance of consciousness due to brain functioning? It seems we really are in the midst of ‘relational’ smoke and mirrors. But, then, it is common for those who want to live in a physical-material world, whether a crude, or a subtle ‘relational’ variety, to assert their dogmatic reductive view with a confidence not befitting the available evidence.

Many neuroscientists seem hell-bent on embracing unsubtle materialist approaches, despite their massive implausibility. As the psychologist Edward F. Kelly points out, in the introduction to the important book *Irreducible Mind: Towards a Psychology for the 21<sup>st</sup> Century (IM)*, the notion that the processes within the brain produce consciousness from completely unaware material stuff “has become more like an established fact, or even an unquestionable axiom.”<sup>40</sup> Such an adamant confidence can be found in many pronouncements by reductionist-materialist, ‘physicalist’, neuroscientists, such as this from the leading neuropsychologist Antonio Damasio, made at the concluding ceremonies of the 1990’s “Decade of the Brain”:

In an effort that continues to gain momentum, virtually all the functions studied in traditional psychology - perception, learning and memory, language, emotion, decision-making, creativity - are being understood in terms of their brain underpinnings. The mysteries behind many of these functions are being solved, one by one, and it is now apparent that even consciousness, the towering problem in the field, is likely to be elucidated before too long.<sup>41</sup>

Such a viewpoint, however, can only be maintained by ignoring a great deal of detailed evidence to the contrary, evidence which is presented in *IM* in great detail. The authors of *IM* have examined and presented dramatic evidence from many spheres of psychological investigation and conclude that reductionist-materialist

accounts of brain and consciousness “are not correct - that in fundamental respects they are at best incomplete, and at certain critical points demonstrably false, empirically.”<sup>42</sup> A more extensive discussion of this topic can be found in my book *Quantum Buddhist Wonders of the Universe*.

The authors of *IM* point to the relevance of the observation that “it seems to be a lesson of history that the commonplace may be understood as a reduction of the exceptional, but the exceptional cannot be understood as an amplification of the commonplace.”<sup>43</sup> In other words the notion that mind can somehow emerge from absolute mindlessness is incoherent and incomprehensible. However as Kelly points out:

This lesson has not penetrated contemporary cognitive science, which deals almost exclusively with the commonplace and yet presumes – extrapolating vastly beyond what in reality are very limited successes – that we are progressing inexorably toward a comprehensive understanding of mind and brain based on classical physicalist principles. This serene confidence seems to us unwarranted. It is now evident, for example, that chess-playing computer programs represent progress toward real intelligence in roughly the same sense that climbing a tree represents progress towards the moon.<sup>44</sup>

And, in contrast to the word-deception that Rovelli employs to try and promote unwarranted metaphysical claims, physicist-philosophers like Henry Stapp give clear conceptual demonstrations of the mistaken nature of the claim that somehow mind ‘emerges’ from an essentially non-conscious material world. And this also applies to ‘relationships’ between unspecified material entities.

An example of such a rigorous conceptual analysis, which contrasts with Rovelli’s word-deception, is provided by Stapp’s refutation of neurobiologist Roger W. Sperry’s claims that ‘mental properties in brain activity ... supervene.’<sup>45</sup> The use of the word ‘supervene’ here is another example of word-deception, the term is used to imply that it denotes a scientifically validated mechanism of transition from matter to mind, wherein in reality none exists! According to Sperry:

[Conscious properties] encompass and transcend the details of nerve impulse traffic in the cerebral networks in the same way that ... the properties of the molecule transcend the properties of atomic components...<sup>46</sup>

Another version of this viewpoint sometimes advanced in order to validate the matter to mind 'emergence' is that the properties of water, for example, 'supervene' or 'transcend' the molecular structure of H<sub>2</sub>O. Such supervenience views, however, do not hold water as arguments for the notion that consciousness magically 'supervenes' upon brain structure and functioning. Stapp explains this by referring to Sperry's example of how 'wheelness' 'emerges' or 'supervenes' from the atomic components of the physical stuff of the 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.<sup>47</sup>

Stapp is indicating that the conceptual move to the properties which are embodied within 'wheelness' are *logically and coherently entailed* within the conceptual framework of the classical physics of materiality in a manner that the properties of consciousness are not:

This 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.<sup>48</sup>

The way in which the material particles within the construction a wheel function as the wheel rotates 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. In other words there is an explanatory chain of connection between the properties of the material wheel and the atomic (conceived classically as Sperry does) constituents of the wheel.

The same applies the supposed ‘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 molecules 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 explains the nature of the liquid state. Furthermore, when we consult an online chemistry exposition we find that:

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.<sup>49</sup>

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 basis to the property which is supposed to magically ‘supervene.’ In the case of consciousness, however, there is an unbridgeable gap which no sophisticated and sophistic juggling of spurious logical concoctions could ever bridge. This is why physicists who wish to promote a false view of the nature of consciousness have to resort to word-deception, or conceptual deception, there is no logically coherent way to validate their claims.

As Stapp points out, and this applies to physicists such as Rovelli who aspire to the role of a philosopher:

Philosophers of mind appear to have arrived, today, at less-than-satisfactory solutions to the mind-brain and free will problems, and the difficulties seem, at least prima facie, very closely connected with their acceptance of a known-to-be-false understanding of the nature of the

physical world, and of the causal role of our conscious thoughts within it.<sup>50</sup>

The crucial phrase here is, of course, '*known-to-be-false*'. According to Stapp the role of mind at the quantum level is incontrovertible, but some physicists, such as Rovelli, Sean Carroll and others, strive to defend obviously incorrect, more 'classical' type positions which are redolent of the worldview of the late nineteenth century in their rejection of a role for mind and consciousness. Admittedly, Rovelli's attempt is more sophisticated in its methods of word-deception, but this does not mask its essentially misleading nature, to those who examine it rigorously. Most readers of course, will not do this, they simply thrill to the word-deception which delivers a false worldview which they assent to as a matter of prior prejudice, or a prior prejudice of matter! Although, to be precise, in the case of Rovelli we are offered 'relations' between unspecified, and non-specifiable (we cannot list all the objects in the universe) material bits, pieces and conglomerates!

The fact that Rovelli fully believes that mind and consciousness are a secondary aspect of the process of reality, in some way 'supervening', or deriving from, matter, is clearly revealed in an internet discussion he took part in on the 'Second Home' channel, the discussion is titled 'Quantum Relations'. At one point Rovelli explains that:

Science at some point has told the rest of the culture that there is a simple mind version of materialism, in which the world is just little stones bouncing around. It is only true in an approximation. If you listen to science and look at things better, things are more complex than that. Not because there are magic spiritual things effecting things, .... I'm a naturalist, a materialist in a larger sense ... Reality is not just stones bouncing around, there is space in physical reality for much more complexity than what instinctively comes out from the cold icy world of classical physics ... Quantum physics is richer, ... in my book I try to indicate the domain in which we are misled by thinking that the world is like classical physics, including when we think about consciousness.<sup>51</sup>

So here Rovelli clearly states his allegiance to materialism. But it is not the “cold icy world of classical physics”, it is instead, presumably, a new, more fluffy and cuddly kind of materialism. But it is interesting that in this discussion Rovelli does not tell us how his new warmed-up ‘relational’ materialism accounts for consciousness, he cannot, for, as we have seen, in his book he assassinates it from existence, and uses word-deception to imply it is still there in some kind of illusory relational-material form.

I am not alone in suggesting that Rovelli employs what I have dubbed ‘word-deception’. The astrophysicist Lisa Randall gave a very damning review of Rovelli’s popular book *Reality is Not What It Seems* in the New York Times a while ago:

The beauty of physics lies in its precise statements, and that is what is essential to convey. Many readers won’t have the background required to distinguish fact from speculation. Words can turn equations into poetry, but elegant language shouldn’t come at the expense of understanding. Rovelli isn’t the first author guilty of such romanticizing, and I don’t want to take him alone to task. But when deceptively fluid science writing permits misleading interpretations to seep in, I fear that the floodgates open to more dangerous misinformation.<sup>52</sup>

And:

Compounding the author’s challenge is the need to distinguish between speculation, ideas that might be verified in the future, and what is just fanciful thinking.<sup>53</sup>

And, it must be pointed out that Randall is certainly not a supporter of quantum-mystical views. But it is also worth noting that one commenter on this blog post points out:

Yeah, the author of a book proclaiming that dark matter likely did in the dinosaurs criticizing Rovelli for lack of clarity about what is speculation seems a bit rich to me.<sup>54</sup>

This refers to a speculative claim made in Randall’s book *Dark Matter and the Dinosaurs: The Astounding Interconnectedness of the Universe*, and she makes it quite clear about the speculative status of her scientific fantasy, which is, as reported in the Guardian newspaper:

how a putative disc of dark matter in our galaxy could potentially be responsible for dislodging lumps of rock from the distant Oort cloud which then hurtle towards Earth – possibly leading to events as catastrophic as the planet’s fifth mass extinction – every 35 million years, or so.<sup>55</sup>

Keep this in mind when you read the quote from philosopher Bernardo Kastrup below, on page 138.

In the context of quantum mysticism, there are some physicists, however, who thrill in the opposite direction to Rovelli and his love of the relational-material world, and his suspicion of real consciousness, rather than a relational illusion. Such supporters of a place for consciousness in the universe perhaps sometimes go over the top in their dissent from the official subtle-materialist worldview. We have seen quite a few seriously over-inflated claims by New-Age Propheteers in previous chapters. But, on the other hand, there are physicist-philosophers, such as Henry Stapp, who present evidence-based, conceptually coherent and precise, technical books and articles that demonstrate that:

We live in an *idealike* world, not a matterlike world.’ The material aspects are exhausted in certain mathematical properties, and these mathematical features can be understood just as well (and in fact better) as characteristics of an evolving idealike structure. There is, in fact, in the quantum universe no natural place for matter. This conclusion, curiously, is the exact reverse of the circumstances that in the classical physical universe there was no natural place for mind.<sup>56</sup>

And, as we shall see, there are cogent, logically coherent reasons to draw this conclusion from the evidence of quantum physics.

Rovelli, however, descends into unthinking melancholy and outrage when confronted with such views:

It is with sadness that every so often I spend a few hours on the internet, reading and listening to the mountains of stupidity dressed up with the word ‘quantum’. Quantum medicine; holistic quantum theories of every kind; mystical quantum spiritualism - and so on and on, in an almost unbelievable parade of quantum nonsense. ... Quantum mechanics has nothing to say about paranormal phenomena,

alternative medicine or the influence of mysterious waves or vibrations.<sup>57</sup>

The problem with such a blanket, indiscriminating condemnation of all interest in, research into, and claims of possible connections between quantum functioning and phenomena associated with the mind, consciousness, and parapsychological and spiritual phenomenon, is that, whilst it is true that there are people who have a track record of overstating such connections, sometimes venturing into the realms of absurdity, there are also highly qualified, philosophically sophisticated researchers who disagree with Rovelli's dogmatic and unqualified, and unsupported by evidence or reasoning, blanket condemnation.

Michael B. Mensky, for example, was a highly qualified physicist and professor working at the Lebedev Physical Institute of the Academy of Science in Moscow. He worked in fields such as quantum field theory, quantum gravity, quantum theory of measurement and the foundations of quantum physics. His qualifications make him easily as knowledgeable and credible in the field of quantum physics and metaphysics as Rovelli. In fact, a careful reading of Mensky indicates he is much more philosophically competent than Rovelli, who, as we have seen, has a penchant for underhanded conceptual juggling. Mensky completely disagrees with Rovelli on this issue. According to Mensky:

Life is not the function of the body, and consciousness is not a function of the brain. Rather [the] body is a realization of life, and brain is an instrument of consciousness.<sup>58</sup>

For Mensky the latest discoveries of science lead towards the necessary acceptance of the fact that the process of reality is ultimately immaterial and has a fundamental spiritual dimension involving consciousness. Mensky provides detailed evidence and coherent reasoning for his 'Extended Everett Concept' (EEC), a development, embracing consciousness as fundamental, of the Many-Worlds perspective, which indicates that:

...the phenomena of life and consciousness cannot be mechanistically reduced to the action of the laws of science as they are found in the course of exploring [inanimate] matter. The explanation of these phenomena

on the basis of quantum mechanics requires [the] addition of a special independent element to the set of quantum concepts and laws. Such a new element of theory should directly connect quantum concepts with the concepts characteristic of life. The simplest way to find this element is to consider the phenomenon of consciousness and compare it with the description of observation (measurement) in quantum mechanics.<sup>59</sup>

And in his explorations Mensky has found that connections:

...may be found in the spiritual sphere of knowledge (oriental philosophies, world religions and deep psychological practices). As a result, a much closer unification of the material and spiritual spheres of knowledge [can be] achieved.<sup>60</sup>

Mensky's quantum spiritual psycho-metaphysics is in fact an overarching paradigm for a post-materialist science and philosophy which embraces consciousness and spirituality. In particular, his quantum-spiritual psycho-metaphysics is entirely consistent and coherent with Buddhism.

Another significant physicist whose views are certainly at odds with those of Rovelli is Paul Davies who has suggested the notion of a "self-explaining universe", which he has written about in his book *The Goldilocks Enigma*:

...a good case can be made that life and mind *are* fundamental physical phenomena, and so must be incorporated into the overall cosmic scheme. One possible line of evidence for the central role of mind comes from the way in which an act of observation enters into quantum mechanics. It turns out that the observation process conceals a subtle form of teleology.<sup>61</sup>

Such a universe would necessarily contain organisms that embody the capacity for cognition, which is to say consciousness, precisely because the purpose of 'self-explanation', to use Davies' terminology, or self-cognition, is fundamental to the universe. It is part of the "teleology" of the universe.

The philosopher Bernardo Kastrup, in his article 'Reasonable Inferences From Quantum Mechanics: A Response to "Quantum

Misuse in Psychic Literature”, in which he seeks to defend claims of possible quantum psychic effects, has made the following appropriate observation:

Moreover, wild—and often ungrounded—speculation isn’t a privilege of non-physicists. Today, physics itself is indulging in the most farfetched feast of speculations ever concocted by the human mind: multiple different types of parallel universes, each type potentially comprising a multi-dimensional infinity of such universes; 10 spatial dimensions, many of which are supposedly curled up into tight little knots of extraordinary topological complexity; widely conflicting views about the nature of time, such as that time does not actually exist, that time is precisely the only thing that in fact exists (space being illusory), and that time exists but isn’t fundamental, emerging instead from microscopic quantum processes; the accommodation of complete unknowns by mere labeling, such as the notions of dark matter and dark energy; widely differing views regarding the origin and early evolution of the universe; and the list goes on. Given all these seriously discussed hypotheses, it is difficult for physicists to take the moral high ground and criticize non-physicists based merely on the fact that the latter are engaging in physical speculation. Compared to the conjectures of many professional physicists, allusions to quantum phenomena in health care and parapsychological literature sound rather moderate and conservative.<sup>62</sup>

Indeed, Rovelli’s own speculations can be surely be counted amongst what Kastrup calls “farfetched feast of speculations ever concocted by the human mind”. And, furthermore, if Rovelli truly believes, as he claims in *Helgoland*, that

...any interaction between two physical objects can be seen as an observation. We must be able to treat any object as an ‘observer’ when we consider the manifestation of other objects to it ... quantum theory, I believe, is the discovery that the properties of any entity are nothing other than the way in which that entity influences others. ... Quantum theory is the theory of how things influence each other.

Surely he would expect to live in a world in which all aspects of the process of reality “influence” all other aspects, operating

relationally at the quantum level? Should, then, psychic, para-psychological phenomena be so unexpected in a universe governed by Rovelli's 'relational' view of quantum theory? Are not such relationship-influences between the physical relationships which seem to be mental, and those relationships which manifest as 'health' (in the same way that 'rainbows' manifest!) apparently creating yet more manifestations of a psychic influence, are not all these, ... are they not 'relational manifestation influences'??

Mensky, who is equally qualified in quantum theory as Rovelli and had no personal religiously-based mystical leanings, shows no doubt that quantum theory requires the existence of 'probabilistic miracles':

Probabilistic miracles essentially differ from "absolute" miracles that happen in fairy tales. The difference is that the event realized as a probabilistic miracle (i.e. "by the force of consciousness") may in principle happen in a quite natural way, although with a very small probability. This small but nonzero probability is very important. Particularly, because of the fundamental character of probabilistic predictions in quantum mechanics, it is in principle impossible to prove or disprove the unnatural (miraculous) character of the happening.<sup>63</sup>

In other words consciousness can in some circumstances amplify quantum potentialities which have small probabilities so that they, seemingly miraculously, become actualized. The important point that Mensky makes is that, although such events may appear to be 'supernatural', they are in fact entirely natural because they are the result of a quantum 'postcorrective' capacity of consciousness. The 'postcorrective' mechanism is that by which consciousness can alter quantum states to steer a course into future possibilities. This occurs because consciousness can see into future quantum states and then make a correction 'post', i.e. after, future possibilities are comprehended. Such a mechanism operates in photosynthesis. An example at the human level is provided by cases of individual or group prayer which may lead to a healing which appears miraculous. According to Mensky such events are not "unnatural" because there is a quantum probability for the apparent miracle to occur. This probability can be amplified by certain activities such as prayer.

Although Mensky's analysis of the way in which the quantum world differs from that of Rovelli, there is no reason for a similar mechanism not to be operative in Rovelli's worldview. In Rovelli's quantum world one would have to speak of 'relational influences' rather than consciousness. Rovelli does not give any reasoning why he rules out parapsychological phenomena, surely one might have thought in Rovelli's universal 'relational' universe all kinds of relational influences should be operative. It seems that Rovelli proclaims his negative decree as a matter of dogmatic personal taste, or, perhaps, allegiance to the subtle-materialist anti-quantum-mystical academic thought police agenda.

Finally we must address Rovelli's cultural appropriation of the ideas of the great 2<sup>nd</sup> century Indian Buddhist Madhyamaka philosopher Nagarjuna. I use the term 'cultural appropriation' only partly tongue in cheek, for Rovelli actually tells us:

What really interests us about ancient texts is not what the author initially intended to say; it is how the work can speak to us now; and what it can suggest today.<sup>64</sup>

Of course, for someone studying Buddhism and Buddhist metaphysics this is not correct. And, as we shall see, such a dismissive attitude, which seems to suggest that Nagarjuna does not have a clear and precise meaning which can be understood today, leads Rovelli slightly astray in his understanding!

As Rovelli correctly describes the central aspect of Nagarjuna's *Madyamaka* - Middle Way - analysis, as laid out in Nagarjuna's central work *Mulamadhyamakakarika* - *Fundamental Verses of the Middle Way*:

The central thesis of Nagarjuna's book is simply that there is nothing that exists in itself, independently from something else. The resonance with quantum mechanics is immediate. ... If nothing exists in itself, everything exists only through dependence on something else. The technical term used by Nagarjuna to describe the absence of independent existence is 'emptiness' (*sunyata*); things are 'empty' in the sense of having no autonomous existence.<sup>65</sup>

And this is a correct presentation of the central insight, which is reiterated in many different contexts in Nagarjuna's Madhyamaka

works. In the 15<sup>th</sup> section of Nagarjuna's *Fundamental Verses*, which is 'An Analysis of Intrinsic Nature' Nagarjuna asserts that:

It is not correct to say that intrinsic nature (*svabhava*) is produced by means of causes and conditions.

An intrinsic nature that was produced by causes and conditions would be a product.

But how could there ever be an intrinsic nature that is a product?

For intrinsic nature is not adventitious, nor is it dependent on something else.<sup>66</sup>

The Buddhist concept of *svabhava*, 'intrinsic nature', or 'inherent existence', or 'intrinsic essence', denotes something which does not exist. Rigorous investigation of the functioning of reality in the manifested world shows does not exist. A phenomenon which is not dependent upon other phenomena and conditions, and which has its own self-enclosed *svabhava*, or independent and substantial inner essence, is not found within the process of reality. This is why a core tenet of all Buddhist schools is 'dependent origination':

Dependent origination (Skt: *pratityasamutpada*, Pali: *paticca-samuppada*) is also known as conditioned co-arising and several other terms. Buddhism teaches that everything that exists is conditioned—dependent on something else. This applies to thoughts as well as objects, to the individual as well as the entire universe. Nothing exists independently. Everything is conditioned. This concept is illustrated in the Buddhist teachings of the chain of dependent origination, which describes the factors that perpetuate the cycle of birth, death, and rebirth. The twelve links in the chain are sequential, each factor causing the following one: Because of this, that arises. When this ceases, that also ceases.<sup>67</sup>

The passage from Nagarjuna above - Analysis of Intrinsic Nature - describes in detail why entities do not have 'intrinsic nature'. Something which has its own self-enclosed inner core of being, its own 'inherent existence or 'intrinsic nature', would have to be entirely and absolutely not dependent, not related to any other phenomena, for this is what the term 'intrinsic nature' denotes. This means that something which has, or is, an intrinsic nature cannot be a product, cannot be adventitious, cannot be produced

by causes and conditions, by definition. An intrinsic nature is something not produced by cause and conditions.

According to Rovelli, Nagarjuna:

...recognizes the fact that to inquire about the ultimate foundation of everything is to ask a question which perhaps simply does not make sense. .... Nagarjuna is not a nihilist negating the reality of the world, and neither is a skeptic denying we can know anything reality.

As we shall see, the first claim is mistaken, indicating that Rovelli does not fully understand Nagarjuna's insights. Nagarjuna does have a view concerning the ultimate nature and it does make sense! But not the kind of sense that most people expect, or desire, from an ultimate nature, a nature which is not an intrinsic nature! And then, despite the fact that Rovelli has just told us that Nagarjuna is not a nihilist, he writes at the end of his chapter on Nagarjuna that:

Nagarjuna teaches the serenity, the lightness and the shining beauty of the world; we see nothing but images of images. Reality, including ourselves, is nothing but a thin and fragile veil, beyond which ... there is nothing.<sup>68</sup>

This assertion is controversial from a physics point of view, wherein the usual view is that the final ground of the process of reality is made up of quantum fields, not "nothing". And it is a nihilistic viewpoint not consistent with Nagarjuna's philosophy. It seems that Nagarjuna's philosophy is far more subtle than Rovelli can comprehend, for Nagarjuna asserts the necessity to not rely on existence as ultimately existing, but, on the other, to also not think that non-existence is an ultimate feature of the process of reality. For in Nagarjuna's section on Nirvana, the ultimate experiential realm of the unconditioned, he tells us:

And if nirvana were an existent, how could we say that nirvana is nondependent?

For never is there found any existent that is nondependent.

If nirvana is not an existent, how will nirvana be an absence?

Where there is no existent, there is no absence.

And if nirvana is an absence, how can nirvana be nondependent?

There is no absence that exists without dependence.<sup>69</sup>

The Jay L. Garfield translation of Nagarjuna's *Fundamental Verses*, which is the translation Rovelli refers to, employs the term 'non-existence' instead of the word 'absence':

If nirvana were not existent,  
How could nirvana be nondependent?  
Whatever is nondependent.  
Is not nonexistent.<sup>70</sup>

The implication is quite clear; Nirvana, the ultimate unconditioned, and therefore 'nondependent', is not an existent, nor a nonexistent. So Rovelli's assertion that Nagarjuna believed, or had concluded, that the ultimate nature is "nothing" is just wrong. The assertion that there is "nothing", or 'nonexistence', beyond the relational deconstruction into emptiness is explicitly rejected by Nagarjuna:

"It exists" is an eternalist view; "It does not exist" is an annihilationist idea.

Therefore the wise one should not have recourse to either existence or nonexistence.<sup>71</sup>

So, it is clear that Nagarjuna explicitly states that 'wise' people would **not** claim that the ultimate nature beyond the relationships of the manifest world can be said to be 'nonexistence', or 'nothing'. I guess Nagarjuna, if he were around today, would not consider Rovelli to be very wise.

As we have seen, emptiness, or *sunyata*, is the central Madhyamaka concept which indicates the fact that all phenomena lack *svabhava*, 'intrinsic nature', or 'inherent existence'. There is no phenomenon that has its own inner core of independent, self-enclosed own-nature which marks it off and separates it absolutely from all other phenomena. The following comes from the eleventh century Buddhist treatise the 'Book of Kadam':

Now I shall cast to the winds concepts of solid objects  
with mass.<sup>72</sup>

And:

This world of deceptive conventions is a lie; ...

Since these manifestations without existence are devoid of  
core ...

All things are but mere appearances ...

Even should the entire world surround me

And argue against me, claiming that phenomena are real,

I ... would find them the greater laughingstock.<sup>73</sup>

Here the Buddhist practitioner-philosopher Dromtonpa vigorously proclaims that external, independent, self-powered, ‘real,’ by which he means independent of mind, solid and inherently massive objects do not exist in the way that they appear to. In other words the eleventh century Buddhist thinkers had figured out that the very impressive and imposing illusion of a completely independent ‘material’ reality, an apparently external to consciousness structure of ‘matter’ which has its own internal ‘solid’ ‘mass’ was ‘devoid of core’ and devoid of independent internal mass.

According to Buddhist metaphysics all phenomena ultimately are ‘empty’ appearances which manifest from what we can call, following Aguirre, and employing modern scientific language, as the *field* of insubstantial ‘emptiness’. Emptiness, then, can be identified as a *sunyata-field*, a quantum-like field of potentiality underlying the seemingly material appearance of the experiential world. The term ‘*sunyata*’ in fact derives from a notion of vast potentiality. The root of the term *sunyata*, which is translated as *emptiness*, is *sunya*, the zero point, the cosmic seed of emptiness which is ‘swollen’ with potentiality. One meaning of *sunya*, which is the Indian origin of the concept of zero, is ‘the swollen’, in the sense of an egg of potentiality which is about to burst into manifestation.<sup>74</sup> And such a field is not ‘empty’ of the internal aspect of cognitive-functioning, or consciousness, although consciousness is ‘empty’ of material-substantial-nature.

The important twentieth century physicist David Bohm presented a remarkably similar view in his article ‘The Implicate Order: A New Order for Physics’, the headline summary reads:

The author suggests that emptiness is really the essence. It contains implicitly all the forms of matter. The implicate order really refers to something immensely beyond matter as we know it — beyond space and time. However, somehow the order of time and space are built in this vacuum. At present there is no law that determines the vacuum state.<sup>75</sup>

Bohm’s notion of the ‘implicate order’ suggests an immaterial underlying realm of potentiality which is the common source of

both the material world and consciousness:

...matter and consciousness can both be understood in terms of the implicate order. We shall now show how the notions of implicate order that we have developed in connection with consciousness may be related to those concerning matter, to make possible an understanding of how both may have a common ground.<sup>76</sup>

This common ground Bohm referred to as ‘emptiness’ on several occasions. And, as we have previously seen, in his important work *Wholeness and the Implicate Order* he wrote:

To obtain an understanding of the relationship of matter and consciousness has, however, thus far proved to be extremely difficult, and this difficulty has its root in the very great difference in their basic qualities as they present themselves in our experience. This difference has been expressed with particularly great clarity by Descartes, who described matter as ‘extended substance’ and consciousness as ‘thinking substance’. Evidently, by ‘extended substance’ Descartes meant something made up of distinct forms existing in space, in an order of extension and separation basically similar to the one that we have been calling explicate. By using the term ‘thinking substance’ in such sharp contrast to ‘extended substance’ he was clearly implying that the various distinct forms appearing in thought do not have their existence in such an order of extension and separation (i.e., some kind of space), but rather in a different order, in which extension and separations have no fundamental significance. The implicate order has just this latter quality, so in a certain sense Descartes was perhaps anticipating that consciousness has to be understood in terms of an order that is closer to the implicate than it is to the explicate.<sup>77</sup>

Thus Bohm clearly indicates that the essential nature of the ground-energy-field of the process of reality is of the nature of Mind, not matter. The individuated consciousnesses of sentient beings, however, must be understood to be stepped-down from the intensity of Primordial Mind.

Thus we see that Bohm came to a similar conclusion as the Zen-master Hung Po:

This pure Mind, the source of everything, shines forever and on all with the brilliance of its own perfection. But the people of the world do not awake to it, regarding only that which sees, hears, feels and knows as mind. Blinded by their own sight, hearing, feeling and knowing, they do not perceive the spiritual brilliance of the source substance. If they would only eliminate all conceptual thought in a flash, that source substance would manifest itself like the sun ascending through the void and illuminating the whole universe without hindrance or bounds.<sup>78</sup>

And also the Zen-master Dogen:

“All sentient beings,” discussed now in the Buddha way, means all sentient beings possessing mind, for mind is itself sentient beings. Those beings not possessing mind should equally be sentient beings, because sentient beings are, as such, mind. Therefore, mind is invariably sentient beings; sentient beings are necessarily the Buddha-nature of existence. Grasses and trees, and countries and lands are mind. They are sentient beings in virtue of being mind, and are the Buddha-nature of existence on account of being sentient beings. The sun, the moon, and the stars - all are mind. They are sentient beings by reason of being mind, and are the Buddha-nature of existence because of being sentient beings.<sup>79</sup>

Here, of course, the description of the ultimate Mind-Energy-Field of the process of reality is itself energized by the Mind of an advanced Buddhist practitioner.

To return to a more prosaic level, another significant physicist, Lee Smolin, has also noted the fact that the world of things is ultimately in some sense an illusion:

Newtonian physics ... gives rise to the illusion that the world is composed of objects. ... But relativity and quantum theory each tell us ... no, better, they scream at us, that our world is a history of processes.<sup>80</sup>

So the disappearance of material ‘objects’ and ‘things’ from the primary conceptual discourse concerning the deepest levels of physics is an obviously important aspect of modern physics. Physicist Jonathan Allday, in his book *Quantum Reality: Theory and Philosophy*, points out that the phenomenon of quantum entanglement:

...presents us with a philosophical challenge, one that threatens to pick away at our notion of what a ‘thing’ is.<sup>81</sup>

And Allday, in a section he titles ‘Substance Abuse’, tells us that within quantum field theory, at the lowest level of physics, there is no substance, the quantum field is actually ‘empty’ of substance. He writes:

Now, from a philosophical point of view, this is rather big stuff. Our whole manner of speech ... rather naturally makes us think that there is some stuff or *substance* on which properties can, in a sense, be glued. It encourages us to imagine taking a particle and removing its properties one by one until we are left with a featureless ‘thing’ devoid of properties, made from the essential material that had the properties in the first place. Philosophers have been debating the correctness of such arguments for a long time. Now, it seems, experimental science has come along and shown that, at least at the quantum level, the objects we study have no substance to them independent of their properties.<sup>82</sup>

The material world really does appear to disappear into a field of ‘emptiness’.

A deep problem that faces quantum physicists is this: although they have developed mathematical tools to describe and predict the functioning of the quantum world, they have not settled upon a universally accepted set of non-mathematical concepts to employ, because, to many minds, none of our ordinary concepts seem to be appropriate. As Allday says:

The problem is that the small-scale laws describe a way of behaving that, judged by the standards of everyday experience, is utterly bizarre. It is very

difficult to see how all the funny business going on at the atomic scale can lead to the regular, reliable world we spend our lives in.<sup>83</sup>

And this kind of observation has been made by quite a few physicists.

Today many physicists find quantum discoveries concerning the ultimate ‘empty’ nature of reality disturbing. A situation which seems analogous to the manner in which some of Buddha’s followers were disturbed at his teachings concerning the ultimate insubstantial emptiness of all phenomena, although no physicist, as far as I know, have had heart attacks because of the issue. The much lauded physicist Sir Roger Penrose, for example, has written that:

Taken at its face value, the theory seems to lead to a philosophical standpoint that many (including myself) find deeply unsatisfying. At best, and taking its descriptions at their most literal, it provides us with a very strange view of the world indeed. At worst, and taking literally the proclamations of some of its most famous protagonists, it provides us with no view of the world at all.<sup>84</sup>

And Jim Al-Khalili has stated that:

For me the biggest mystery of all lies at the heart of reality: how to explain the weird behaviour of the subatomic world. We have a very powerful theory that explains the atomic world-quantum mechanics. But the problem is no one understands what it means.<sup>85</sup>

However, it may be the case, rather, that many physicists, including Al-Khalili, do not want to know what it means!

In his book *Physics and Philosophy* the physicist and philosopher Bernard d’Espagnat, having reached the conclusion that physics is incapable of ever unveiling the nature of a quantum ‘veiled’ reality conceived of as existing separately and independently of consciousness suggests that insights into the nature of reality might very well come from other directions among which he cites mysticism.<sup>86</sup> In particular he refers to Buddhist philosophy 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.’<sup>87</sup>

And, another physicist who has had similar insights as to the connection between modern quantum concepts and the Buddhist doctrine of Emptiness is Vlatko Vedral, who has written in his book *Decoding Reality* that:

Quantum physics is indeed very much in agreement with Buddhist emptiness.<sup>88</sup>

According to Vedral:

The Universe starts empty but potentially with a huge amount of information. The first key event is the first act of symmetry breaking...<sup>89</sup>

These assertions are clearly indicative that the origin of all phenomena can be thought of as a vast ‘empty’ field of potentiality, or as modern physicists like to speak of - ‘information’. Such a field can be designated the **sunyata-emptiness-field**, the **sunyata-field**.

An important question is: what causes the symmetry breaking within the **sunyata-field**? According to the Buddhist *Ornament of Stainless Light*:

When a world undergoes destruction, there follows a time of emptiness....During this time of emptiness the subtle particles of these five elements exist as isolated fragments and are not in any conventional sense objects of the sensory powers of the eye and so forth. They are known as empty particles and remain isolated in empty space. When the potential of the collective karma is ripened, the subtle air particles come together to form air whose nature is light and moving.<sup>90</sup>

According to this Buddhist perspective it is the internal force of ‘collective karma’, the collective potential energy registered by actions within previous universes, which causes “the first act of symmetry breaking”.







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