Article

Reflections on Materialist Metaphysical Dogmatism (Part III)

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Abstract

Whilst it is true that a great deal of the details of the experimental science which is presented in programmes presented by Cox, Al-Khalili and others is correct, the overall metaphysical perspective within which these details are presented is for the most part appallingly incorrect because they do not accord with the details of modern physics, quantum physics in particular. The metaphysical framework which underpins the general worldview of the programmes presented by both Cox and Al-Khalili largely corresponds to what Stapp refers to as a 'known-to-be-false' materialist perspective. The inappropriate materialist metaphysical dogmatism which underlies such programmes leads to some silly nonsense being presented without any challenge. This article cuts through the metaphysical madness.

Keywords: Quantum theory, quantum 'particles', quantum 'woowoo', quantum entangle-ment, Brian Cox, Jim Al-Khalili, Hawking and Mlodinow, Richard Feynman, Henry Stapp, Rupert Sheldrake, Schrödinger, Planck, Heisenberg, Rosenblum & Kuttner, Robert Maxwell, Anton Zeilineger, Buddhist metaphysics, Madhyamaka, sum over histories, ESP, parapsychology, telepathy, reincarnation, mind and matter, consciousness, quantum metaphysics, incorrect representation of science, Diamond Cutter Sutra.

Figure 14 provides a graphic presentation of the physical-metaphysical (the boundaries between the two are blurred in this context) picture of the evolution of the universe. This process begins with quantum potentiality and once there are sentient beings, or observer-participants, extant within the universe they take part in the process of universal selection and solidification from quantum possibility.

Before the advent of sentient beings that there must have been a less individualized collective 'unconscious' or universal intentionality operating. Once there is a community of sentient organisms inhabiting the universe then their perceptions, which have influence at the quantum level, affect the probabilities which have been projected at the moment of the big bang. If we accept the cosmic story presented by Hawking and Mlodinow then at the point of creation all possible 'alternative histories' are projected into a kind of cosmic possibility space, but none of

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these possibilities are 'actualized' as yet. For full actualization to take place requires the presence of sentient beings to perceive and experience.

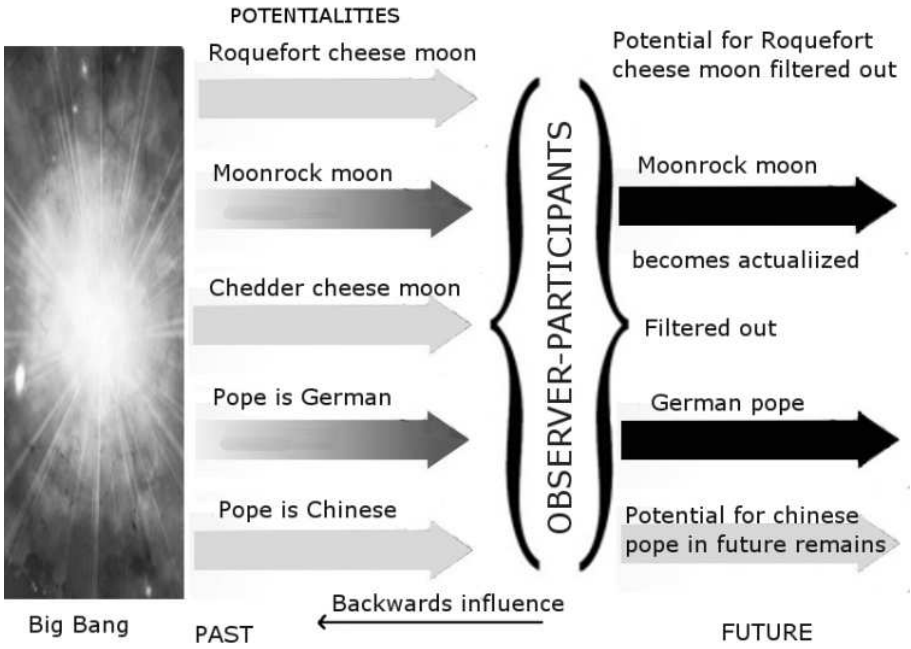


Figure 14

In this model we can visualize all the observer-participants moving through the vast cosmic pool of potentialities and as they do so their perceptions alter the probabilities of potentialities, both backwards and forwards in time. For instance, at the moment of creation there is a possibility (according to H and M) that the moon might end up of being made of Roquefort cheese and also a possibility that it may end up comprised of Moon-rock, as it is in our current universe. When sentient beings get on the job of filtering through the probabilities through their perceptive activities, they somehow 'choose' to have a Moon-rock Moon rather than a Roquefort cheese Moon. Thus the possibility of a Roquefort cheese Moon is filtered out of the cosmic mix of potentialities whilst the possibility of a Moon-rock Moon is solidified into actuality. John Wheeler described this vision of the process as follows:

Law without law. It is difficult to see what else than that can be the plan of physics. It is preposterous to think of the laws of physics as installed by a Swiss watchmaker to endure from everlasting to everlasting when we know that the universe began with a big bang. The laws must have come into being. Therefore they could not have been always a hundred percent accurate. That means that they are derivative, not primary … Events beyond law. Events so numerous and so uncoordinated that, flaunting their freedom from formula, they yet formulate firm form … The universe is a self excited circuit. As it expands, cools and develops, it gives rise to observer-participancy. Observer-participancy in turn gives what we call tangible reality to the universe …

Of all the strange features of the universe, none are stranger than these: time is transcended, laws are mutable, and observer participancy matters.[1]

And this vision is also contained within the work of several other significant physicists, both current and recent. One example is the work of David Bohm which is being carried forward by Paavo Pylkkänen and Basil Hiley. Bohm calls the cosmic possibility soup the 'implicate order' and the actualized experienced world the 'explicate order':

Bohm calls the implicate order the primary reality, this reality exists 'folded up' in nature and gradually unfolds as the universe evolves, enabling organization to emerge, in this way, the implic-ate becomes explicate over time.[2]

In his important book *Wholeness and the Implicate Order* Bohm gives an overview of his perspective as follows:

Our overall approach has thus brought together questions of the nature of the cosmos, of matter in general, of life, and of consciousness. All of these have been considered to be projections of a common ground. This we may call the ground of all that is, at least in so far as this may be sensed and known by us, in our present phase of unfoldment of consciousness. Although we may have no detailed perception or knowledge of this ground it is still in a certain sense enfolded in our consciousness…[3]

This version endorses the view that there is a common fundamental ground which gives rise to the entire process of the dualistic realm and it also emphasizes the necessary cognitive function of consciousness as funda-mental. Thus it becomes clear that sentient beings are the 'agents' through which the universe acquires both meaning and structure. And Stapp adds weight to this anthropic viewpoint with what he calls 'the two-way quantum psycho-physical bridge':

…the connection between physical behaviour and human know-ledge was changed from a one way bridge to a mathematically specified two-way interaction that involves *selections* made by conscious minds.[4]

It is clear that the cosmic-anthropic vision (although the term 'anthropic' here indicates the operation of consciousness through the agency of *all* sentient beings) provided by Hawking and Mlodinow is entirely consistent with important 'interpretations' made by other significant physicists, in particular Wheeler, Bohm, Stapp, Zurek and Mensky (see later). One can think of these different approaches as differing models exploring our 'veiled reality' from different perspectives. However there are crucial points of overlap which indicate important fundamental features which we may claim to be established as constituting a conceptually correct metaphysical account of reality, these are fundamental features which are not 'veiled'.

The first central metaphysical feature of the nature of the process of reality is that the fundamental ground is a vast potentiality which in its all-encompassing nature contains all possibilities that can ever be manifested in any universe over the time span of beginningless time, and this fundamental ground is in its own nature 'empty' of fixed inherent existence. Indeed in his employment of the phrase 'vast and empty' Cox was entirely correct, although not in the complete sense in which he meant this.

The second central metaphysical feature of the nature of the process of reality is the fact that there is an internal aspect of cognizant intentionality which operates to unfold potentialities in a coherent manner. This picture of the process of reality which derives from quantum theory corresponds remarkably with Buddhist *Dzogchen* metaphysics. Thus Herbert V, Guenther, in his book on *Dzogchen* metaphysics *The Matrix of Mystery* explains the process of the 'pristine' cognitiveness of the fundamental 'matrix' of potentiality:

What this term refers to derives directly from the self-excitatoriness (*rang-rig*) of the field as the universe of and for experience, and as such denotes a sensitivity and alertness that makes cognition possible as such on every level of the bio-sphere. This pristine cognition has a self-referential intention-ality of atemporal primordiality…[5]

Thus we are returned, within a Buddhist context, to Wheeler's vision of the universe as a 'self-synthesized' universe, or the Dzogchen 'self-excitatory universe', which comes into being through an infinite web of internal self-perceptions. As H & M say:

…a well constructed model creates a reality of its own.[6]

By which they mean that any metaphysical model of reality must account for how reality spontaneously combusts into actuality. The only way that the universe could 'unfold' from within itself in this manner is if the ground contained both the potentialities and the cognitive mechanism of perceptual 'unfoldment' within its own nature:

In Dzogchen thought there is the additional factor of intelligence which inheres in the very dynamics of the universe itself, and which makes primordiality of experience of paramount importance. The atemporal onset of this unfoldment occasions the emergence of various intentional structures…[7]

And it is these intentional structures that eventually come into being as sentient beings acting as the agents of the universes self-creation. Thus Wheeler tells us that:

Directly opposite to the concept of universe as machine built on law is the vision of *a world self-synthesized.* On this view, the notes struck out on a piano by the observer participants of all times and all places, bits though they are in and by themselves, constitute the great wide world of space and time and things.[8]

The dovetailing between the Hawking – Mlodinow – Bohm – Wheeler – Stapp (etc.) account of the self-generation of the universe through the operation of a fundamental ground *awareness* and the Dzogchen meta-physical vision is remarkable:.

…all sensory experiences of samsara and nirvana manifest as specific forms that come and go within the expanse of the space of supreme emptiness. The ground aspect of the dharmakaya, buddha nature, becomes evident as the supreme principle that pervades all of samsara and nirvana. This is the ground aspect of awareness as supreme freedom from limitations … samsara and nirvana are the phantasmagoria of a single awareness…[9]

In Buddhist metaphysics the dharmakaya is the ultimate 'body' and ground of reality from which all else manifests, it's essential nature is buddha nature which is vast awareness and compassion which manifests into both *samsara*, which is reality experienced as suffering, and *nirvana*,

reality experienced as absolute freedom and liberation. In its aspect as the ground of potentiality this ground is an 'expanse of the space of supreme emptiness' which is a sphere of potentiality for all phenomena which is 'empty' of substantiality.

It is intriguing to note in this context that in quantum field theory the ground field is indeed empty of substantiality. In this presentation of the Dzogchen view it is asserted that all the phenomena of the process of reality are 'the phantasmagoria of a single awareness'. On the quantum view presented by H & M one would have to conclude exactly this – the process of reality is the creation of an infinitely potent universal awareness acting upon its own infinite potentiality to divide itself up into a multitude of experiential continuums. Such a view has led Stapp to go as far as to suggest that quantum theory is consistent with the notion of God:

This [quantum] situation is concordant with the idea of a powerful God that creates the universe and its laws to get things started, but then bequeaths part of this power to beings created in his own image, at least with regard to their power to make physically efficacious decisions on the basis of reasons and evaluations.[10]

However, it must be pointed out there is very little in Christian Theology that foreshadows quantum theory whereas all forms of Buddhist meta-physics – *Chittmatra-Yogachara* or 'Mind-Only', *Madhyamaka* or 'Middle Way' and *Dzogchen* or 'The Great Perfection' – have extraordinary metaphysical insights which prefigure quantum metaphysics.

Stapp has concluded that quantum theory indicates that reality is essentially Mind-like, a view supported by others. It is not surprising that quantum physicist H. Dieter Zeh has lyrically characterised the meta-physical implications of quantum theory by quoting the Greek philosopher Anaxagoras:

The things that are in a single world are not parted from one another, not cut away with an axe, neither the warm from the cold nor the cold from the warm. When Mind began to set things in motion, separation took place from each thing that was being moved, and all that Mind moved was separated.[11]

Because of the manner in which the structures of reality come into 'existence' from the realm of Mind-like potentiality through the operation of an internal cognizant intentionality, the structures of materiality which surround us, although they appear completely independent of us, are not independent of Mind. This is why Zeilinger talks of the mistaken nature of views that assert "pre-quantum viewpoints, particularly the obviously wrong notion of a reality independent of us."[12]

Quantum physicist Wojciech Zurek, proposer of the quantum Darwinism paradigm, tells us that the ultimate nature of quantum reality is 'epiontic', which means that perception in some sense 'creates' ontology, or perceiving things helps keep them in existence:

…quantum states, by their very nature share an epistemological and ontological role – are simultaneously a description of the state, and the 'dream stuff is made of.' One might say that they are *epiontic*. These two aspects may seem contradictory, but at least in the quantum setting, there is a union of these two functions.[13]

Here he emphasizes the apparently flimsy 'informational' nature of the 'stuff' that makes up the quantum realm, it is 'epiontic' 'dream stuff' that is capable of creating an extraordinary vast structure of apparent materiality. This is an extraordinary thought, if you stop to think about it. The apparently 'solid' realm of materiality is made up of quantum 'dream stuff.' But Zurek also points out that, although the evidence we have in quantum experiments indicates a clear dependence on consciousness, the apparently material structures of the everyday world certainly seem to be existing under their own momentum and weight:

…while the ultimate evidence for the choice of one alternative resides in our illusive "consciousness," there is every indication that the choice occurs much before consciousness gets involved and that, once made, the choice is irrevocable.[14]

And it is this paradox which underlies some of the misunderstandings that have arisen amongst those who embrace some form of 'quantum mysticism' perspective and their opponents.

The cult film *What the Bleep Do We Know* is perhaps a good example of the kind of an over-the-top and over-hyped presentation of the quantum-consciousness perspective, although I must at the same time say that one person I have talked to indicated that if it was not for this film he would have been completely unaware of quantum implications. *What the Bleep* is the cinematic figurehead for a movement promoting the message that anyone can transform their life once they get on the quantum bandwagon. It also appears to help if you buy lots of products from the *What the Bleep* new age Internet store. It is unfortunate that the *What the Bleep* enterprise seems to cheapen and infantilize a serious and important topic. One of the participants, for instance, gives lecture tours in the guise of Dr. Quantum; there is even a new *What the Bleep* promoted book with a cartoon of him as a kind of quantum superman, one can imagine many serious physicists being somewhat irritated by such behaviour.

The film has drawn considerable critical hostility because of its apparent naïve and simplistic message that anyone can transform reality once they grasp the nature of the quantum ground within the universal consciousness. The film also seems to imply that it is possible to easily learn to manipulate the material world through conscious manipulation of the quantum ground. This apparent claim has led one critic to challenge the physicist Amit Goswami, a leading figure in the 'quantum-Mysticism' arena and a central figure in the film, to leap out of a 20th floor window and change material reality on the way down so that he landed unharmed[15], and this kind of criticism is perhaps justified when faced with over-extended claims.

The view presented so far in this current work, however, is that, although the apparently material world is ultimately dependent upon consciousness, it is not amenable to alternation on demand or according to whim by individuals or groups of individuals because the structures of materiality have been produced by the operation of a collective consciousness involving uncountable numbers of sentient beings over a vast time period. They are, to all intents and purposes congealed into stability. But this does not alter the fact that they are, as Zurek says, *ultimately* brought into existence by consciousness.

But whilst this film has irritated a few people with its over-exuberance, Cox, seems to overextend in the opposite direction, clearly implying that there is little difference between the structure of materiality as understood in pre-quantum 'classical' physics and the current quantum understanding. According to him we just have a much more precise appreciation but there really is no mystery involved. In the final remarks in his celebrity lecture he says "There is nothing strange and nothing weird" about quantum physics. But this surely contradicts the fact that according to Stephen Hawking, who has carved out a reputation as the most advanced mind in the entire universe, the collective consciousness of all sentient beings determines the past history of the universe by acting backwards in time on quantum potentialities.

In an article in the Telegraph under the banner *Brian Cox: 'I'm not anti-religion. I'm anti-maniac'* Cox told the reporter Nigel Farndale:

Some try and aggrandize science, and make out you have to be very clever to understand it but I think it is actually very simple and straightforward. It's almost like plumbing. [16]

If this ridiculous statement were true what would we have to make of the observation made by Richard Feynman, someone Cox seems to respect, that "nobody understood quantum physics":

…you get down a blind alley from which nobody escapes. Nobody knows how it can be like that.[17]

Feynman made this observation in 1965. The respected physicists Yakir Aharanov and Daniel Rohrlich, writing 40 years later in their book Quantum Paradoxes (2005), refer to Feynman's remark and add to it. They refer to a Woody Allen joke in which someone goes to a psychiatrist to complain that his brother thought himself to be a chicken. The psychiatrist suggests that the man should commit his brother to an insane asylum; the man replies 'Are you crazy we need the eggs!' Aharanov and Rohrlich observe that:

Quantum Mechanics is crazy – but we need the eggs!'[18]

Come on A & R wise up! Cox has it all sorted out, quantum physics is just "like plumbing!" It is all just like really inherently existing pipes, nuts, bolts and the material stuff of reality, well, at the quantum level its really existing 'quantum particles' visiting every part of the entire universe in an instant! Nothing odd about that!

In the face of such an extraordinary determination to rescue a pre-quantum attitude to the nature of reality we need to ask ourselves seriously: is it likely that the solution to the riddle of existence will turn out to be just like plumbing? How Cox gets away with such absurd statements without being challenged is a quantum mystery. In his lecture Cox seems very taken with the fact that the early development of quantum physics was the domain of young men and was therefore dubbed 'boy physics', I wonder why? However, I do not think any of the 'boys' of early quantum theory were guilty of making remarks of the almost adolescent nature that Cox regularly gets away with.

Apparently Cox regularly launches vitriolic attacks upon views and areas of research that he considers to be contaminated with hippy 'New-Age' 'woo-woo'. In the Telegraph piece devoted to Cox we read that:

He does have a reputation for plain speaking. The Creationist belief that the world is 6,000 years old is dismissed as "b-----ks", anyone who believes the world is going to end next year because of the Mayan calendar is "a moron". And people who believe CERN's Large Hadron Collider will suck the universe into a black hole are "t—ts".[19]

And with these clearly extreme and clearly unlikely views Cox is on pretty safe ground. But when it comes to his attacks on telepathy, and implied rejection of the possibility of phenomena such as reincarnation, as we shall see, he may be out of his depth simply because he is speaking from prejudice and almost certainly has not looked into the evidence contained in books such as, for example, *Entangled Minds* by Dean Radin, which surveys the evidence for telepathy. Certainly, as physicists Henry Stapp and Michael Mensky amongst others have indicated, *quantum theory lends support to the possibility of these phenomena although in no way proving them.* In fact, if Cox's own claim that all the electrons in the universe are in instantaneous quantum communication with each other, were to be true one might reasonably expect the possibility of some form of telepathy.

But we don't need all the electrons in the universe to be interconnected through the Pauli principle to have a quantum phenomenon which could to some extent underlie the possibility for some kind of telepathy. In a section of his book *Sneaking a Look at God's Cards* entitled 'Telepathy or Cheap Trick' Giancarlo Ghirardi describes the situation of quantum entanglement and non-locality, which is the phenomenon wherein entangled 'particles' have what Einstein famously called a 'spooky' instantaneous communication, by using the analogy of a Music Hall act (see chapter 5). He then goes on to describe quantum experiments which indicate that the phenomena of quantum non-locality can only be explained on the basis of 'quantum telepathy'.[20] The entangled 'particles' somehow instantaneously 'know' about each other, even when separated by vast distances. Of course, Ghirardi is using a metaphor here, but, nevertheless, this is a *possible* mechanism for higher level telepathy.

It is this quantum phenomena that Dean Radin, in his book *Entangled Minds* suggests *might* underlie the phenomenon of telepathy which, assuming that Radin and other researchers such as Rupert Sheldrake are not deliberately setting out to perpetrate a massive intellectual fraud, there seems to be significant evidence for. Radin refers to *The Nonlocal Universe* by the historian of science Robert Nadeau and physicist Mena Kafatos. In the following quote the 'Aspect experiments' refer to experiments carried out on entangled quantum 'particles' which confirmed the quantum phenomenon of quantum nonlocality:

All particles in the history of the cosmos have interacted with other particles in the manner revealed by the Aspect experiments. Virtually everything in our immediate physical environment is made up of quanta that have been interacting with other quanta in this manner from the big bang to the present....

Also consider . . . that quantum entanglement grows exponentially with the number of particles involved in the original quantum state and that there is no theoretical limit on the number of these entangled particles. If this is the case, the universe on a very basic level could be a vast web of particles, which remain in contact with one another over any distance in 'no time' in the absence of the transfer of energy or information. This suggests, however strange or bizarre it might seem, that all of physical reality is a single quantum system that responds together to further interactions.[21]

In other words a quantum nonlocal universe is very much like Cox's electronic instantaneously interconnected universe and, as previously indicated, such a universe clearly has a *possible mechanism* for telepathy. The physicist Michael Mensky, the proponent of what he calls the Extended Everett Concept (EEC), has suggested that:

Telepathy arises as an effect of quantum non-locality. The necessary condition for this is the purely quantum regime, i.e. quantum coherence, absence of decoherence. This condition is met not in consciousness, but in super-consciousness which is nothing else as the state of the quantum world as a whole…[22]

In Mensky's presentation of his EEC he suggests an explicit notion of quantum consciousness, and of a quantum 'super-consciousness' which gives rise to the individuated more limited consciousnesses of individuated sentient beings. As we shall see this corresponds exactly to the Buddhist Mind-Only *Yogachara* account of the *alayavijnana*, or a 'ground consciousness'. Furthermore, such an account accounts for certain 'paranormal' phenomena, although in this setting the term 'normal' is more appropriate, in an entirely natural manner that is consistent with quantum theory. In fact such a paradigm would be coherent and consistent even if we were to accept that quantum interconnected 'particles' made up the fundamental ground which gives rise to consciousness. Presumably as a materialist Cox must think that consciousness somehow emerges from quantum particles clubbing together to make macroscopic organic sentient beings, so if all quantum particles are interconnected, does one really need to spell it out? And in such a situation the scientific thing to do would be to look at the evidence, wouldn't it?

Wolfgang Pauli came to a conclusion very close to what we may call a quantum Mind-Only Mensky-type Quantum Consciousness paradigm, which involves a quantum level super-consciousness, or ground consciousness, which corresponds to Bohm's 'implicate order' of potentiality, from which the 'explicate' manifested world emerges. Stapp sums up Pauli's vision, which was based on his appreciation of quantum theory and the psycho-metaphysical work of the great psychologist C. G. Jung, as follows:

Figure 16 - Wolfgang Pauli

Pauli's idea of a regulative principle lying beyond the mind-matter distinction is intertwined with the Jungian concepts of archetype and synchronicity. Synchronicity refers to the occurrence of representations of archetypes in meaningful coincidences that defy causal explanation. Pauli apparently believed, perhaps on the basis of his own experience, that the synchronistic aspects of nature identified by Jung were sufficiently striking to place them beyond the bounds of explanation in terms of pure chance. This judgment, if correct, would mean that behind the processes of nature that we already know and understand there lies another, which acausally weaves meaning into the fabric of nature.[23]

Could it possibly be the case that the discoverer of the Exclusion Principle, Cox's "unbreakable law of nature", was a 'mischievous hippy,' as Cox refers to purveyors of what he considers to be quantum woo-woo? He doesn't look much like one! (See figure 16)

The Feynman path integral, Cox tells us, can be thought of as a machine for calculating probabilities and, because the atoms of the diamond are all busy exploring every nook and cranny of the universe, there is a very tiny probability that the diamond will disappear from its box. He then derived the formula to use for calculating the time we would need to wait before the diamond disappearing act might possibly occur and, after an appallingly embarrassing piece of bad theatrics when he forced Jonathan Ross to per-form the calculation, it turns out to be 3 x 10^{27} seconds which is something like 600 billion times the age of the current universe.

At this point Cox displays his amazing lack of metaphysical insight and sensibility. He seems to be profoundly philosophically blind, for it seems that for Cox there is no difference between a universe in which diamonds *might* disappear at some point during an unimaginable time period and universe in which this *could never happen* because it was made up of what Buddhist philosophy refers to as 'inherently existent' bits and pieces which behave themselves and stay put rather than dashing about instantaneously all over the universe.

It is important to understand the significance of the notion of 'inherent existence', a notion whose actuality cannot be found anywhere in the universe. An inherently existent universe would be one where somewhere at some level of the physical analysis of phenomena an ultimate indestructible 'particle' could be found. This would be the inherently existent 'particle', or set of 'particles'. Such 'particles', in order to be inherently existent, would need to be indestructible, eternal, and changeless. This was precisely the kind of picture of the reality of the universe which underpinned the pre-quantum 'classical' period of physics, the Newtonian 'mechanistic universe.' As Bohm described the situation:

…physics has become almost totally committed to the notion that the order of the universe is basically mechanistic. The most common form of this notion is that the world is assumed to be constituted of separately existent, indivisible and unchangeable 'elementary particles'', which are the fundamental 'building blocks' of the universe. [24]

Goswami, another dissenter from the mainstream scientific paradigm and therefore in Cox's eyes almost certainly a purveyor of "wishy-washy drivel-ly nonsense," depicts this fundamental, and yet mistaken, viewpoint as follows:

The current worldview has it that everything is made of matter, and everything can be reduced to elementary particles of matter, the basic constituents – building blocks – of matter. And cause arises from the interactions of these basic building blocks or elementary particles; elementary particles make atoms, atoms make molecules, molecules make cells, and cells make the brain. But all the way, the ultimate cause is always the interactions between elementary particles. This is the belief – all cause moves from the elementary particles.[25]

This is the kind of view that Cox wants to reinstate by asserting the inherent reality of 'quantum particles'. He wants an inherently REAL universe to be inherently established on the basis of inherent existent 'quantum particles'. But such a view is mistaken because it is clearly at variance with the quantum evidence.

If one requests a definition of the word 'real' from a Google search one will find the following definitions appearing prominently in the results.

Actually existing as a thing or occurring in fact; not imagined or supposed, actual - true - genuine - veritable - factual; of or relating to fixed, permanent, or immovable things, not artificial, not fraudulent, not illusory : genuine; true; not merely ostensible, nominal, or apparent; existing or occurring as fact; actual rather than imaginary, ideal, or fictitious…

'Real' entities are also generally defined and considered to be independent of mind, existing 'out there' in the 'objective' world completely independent of the minds of observers. The notion of such entities was refuted by Wheeler who stated that in the light of quantum theory:

The universe does not 'exist, out there,' independent of all acts of observation. Instead, it is in some strange sense a participatory universe.[26]

The entities of the universe as now described by the interrelated quantum physical-metaphysical theories of Heisenberg, Pauli, Bohm, Stapp, Zurek, Wheeler, Hawking and Thomas Hertog (the account presented in *The Grand Design* is due to Hawking and Hertog), and others, which are

the most currently widely accepted views, are certainly not REAL in the above dictionary sense, which is the generally accepted meaning of the term.
It is quite clear from the Hawking and Mlodinow quantum vision of the evolution of the universe that the fundamental and primary metaphysical features from which the apparent world of materiality emerges comprise a realm of potentiality and awareness or consciousness. The façade of materiality therefore becomes an epiphenomenon generated by the operation of an inter-subjective collective consciousness on the potentialities available at the outset. This metaphysical-cosmological account of the self generation of the universe through the operation of a deep level of awareness which becomes embodied into all sentient beings is also at the heart of Buddhist metaphysics:

The entire world was created through latent karmic imprints. When these imprints developed and increased, they formed the earth, the stones, and the seas. Everything was created through the development or propagation of these latent karmic potentials.[27]

'Karmic imprints' are potentiality templates created by previous sentient perception and activity. At the point of the 'big bang' there can only be potentialities, inherited from previous universes. There must have been a vast, empty yet infinite pool of potentiality which is somehow triggered into manifestation. As H & M say:

We are the product of quantum fluctuations in the very early universe. [28]

And what triggered these quantum fluctuations? The very nature of the H-M TOE requires that we accept that it is a deep level of non-individuated consciousness, there is nothing else to start doing the 'choosing' to eventually filter out a moon 'made of Roquefort cheese'.

There are, then, two possible metaphysical visions of the ultimate nature of reality, one correct and one incorrect. The incorrect one is the pre-quantum 'classical' metaphysical vision of an inherently and completely 'objective' realm of materiality which exists completely independent of mind. In such a universe the atoms of a diamond would stay at home and not go instantaneously exploring the vast emptiness of the universe. Furthermore diamonds in inherent existent universes would not have any probability of suddenly disappearing (barring a bank heist that is); they truly would be 'forever', at least in terms of their inherent constituent parts.

The correct vision on the other hand, now uncovered by quantum theory, is the one in which the 'matter' of the apparently 'material world' is created through the operation of a deep level of the intentionality of Mind acting upon a quantum potentiality pool. The material world, built up over vast time scales, according to Buddhist cosmology involving countless universes over unimaginable time scales, is, in any particular universe, 'held in place' by the intentionality embodied in the perceptions and actions of all the inhabitants of that universe.

This is actually indicated by the quantum Zeno effect, which is the mechanism of fixing quantum reality through rapid perceptions. This effect has been demonstrated in quantum experiments. John Gribben describes an experiment carried out at the U.S. National Institute of Standards and Technology which employed the Zeno effect 'to make the pot beryllium ions boil, and to watch it while it was boiling – which stopped it boiling.'[29] The experiment involved getting beryllium

ions to jump between quantum states in a given period of time, the time being the time required for 100% of the ions to move from one state to another. The experimenter then stopped this quantum jumping by constantly observing, using a laser, and thereby fixing the ions into the first state:

The act of looking at the ion has forced it to choose a quantum state, so that it is now once again purely in level 1. The quantum probability wave starts to spread out again, but after another 4 milliseconds another peek forces it to collapse back into the state corresponding to level 1. The wave never gets a chance to spread far before another peek forces it to collapse back into level 1 …[30]

This is an example of the quantum Zeno effect being consciously employed to manipulate quantum reality through rapid perception.

In the situation of the ions held in place by the quantum Zeno effect it is the intentionality of the experimenters that hold the ions in position. In the case of the universe it is the intentionalities of all the sentient beings inhabiting it which keeps it going! Cox is correct about the atoms of the diamond wanting to spread out all over the universe. However, the reason that they do not do so is because they have been fixed into place by the operation of the collective consciousness of vast numbers of sentient beings, and before there were sentient beings there was a deep level of universal awareness moving evolution along at what Bohm called quantum 'implicate' levels, a fact which clearly indicates that the current materialistic presentation of Darwinism is wrong, we need a fully quantum account of the Darwinian process.

This quantum metaphysical-cosmological vision is clearly indicated by the quantum evidence and current theories. The physical world is manifested from the patterning of the quantum ground, a patterning which is created by the perceptive activities of the consciousnesses of countless sentient beings over unimaginable stretches of time. Indeed, there are quantum physicists who, apparently without any mystical axe to grind, propose a fully Mind-Only view of reality:

They will tell you that 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.[31]

Because the moon has taken vast stretches of time to materialise through the operation of the resonant karmic perceptual activities of a countless number of sentient beings, it would take an equally vast period of time to quantumly melt away into emptiness. And what is true for the moon is clearly also true for the diamond. And the fact that the 'sum-over-histories' equation gives us a vast time period in order for the diamond to fade away does not alter the fact that diamonds and moons have the potentiality fade away, and universes created out of such 'dream stuff' are not inherently existent universes. In fact they are, if we use language with precision,

illusory universes, however long they continue. Vast as they may be they will eventually fade away into emptiness!

According to the *Mahayana*[32] Buddhist tradition the Buddha taught his bad news (for those who want a REAL – and materialistic - world) about reality, i.e. that it does not exist in the way that we think it does and is in fact an illusion, in stages. In the earlier teachings, referred to as *Hinayana*, or the fundamental vehicle, he taught his followers about the fact that human beings are generally misled by the innate notion that they have a fixed essence, a kind of unchanging 'self' somewhat like a 'soul', which made them who they were. This notion, he taught, was completely incorrect. If the psychophysical process of a sentient being is analyzed into constituent processes it will be found that there are only the processes of the *skandhas*, the psychophysical constituents: form, feeling, discrimination, mental formations, and consciousness. When one realizes this at a deep level of awareness a human being can be liberated from the sorrow of existence through the fundamental knowledge and direct realization that in actuality there is nobody existing to be sorrowful! This is the fundamental teaching, and in this teaching the Buddha did not say too much about the actual apparent 'physical' stuff of reality, although he does say in the *Phena Sutta* that the physical world is "like a glob of foam."[33]

In later sutras such as the Diamond Cutter Sutra (*Vagrakkhedikâ, Vajracchedikā Prajñāpāramitā Sūtra*) the Buddha is said to have given far more profound and shocking teachings regarding the nature of all phenom-ena, including the apparently material world, it's all an illusion:

As a star, a visual aberration, a lamp, an illusion, dew, a bubble, a dream, lightening and a cloud – view the compounded like that.[34]

Stars appear at night but when the sun arises, and in this metaphor the sun can be taken as representing the wisdom which understands the true nature of reality, they appear to disappear. In like manner when the entities of the apparently solid material world are seen and understood as they really are, which is 'empty' of all REAL independent solidity, the appearance of true independent reality really does disappear. Because of this the appearance of independent solid existence is like a visual aberration. The flame of butter lamp does not last long; it flares and quickly dies out. The Buddha asserted that all phenomena to be like this.

It seems that Cox thinks that there is an *ultimate* difference between phenomena which come into apparent being for short instances of time and those which last for billions of years, the latter being in some sense more real. But this is incorrect if we are talking about the *ultimate* nature of reality; after all, it's just a matter of time, and time is relative! Something which comes into apparent being for a short length of time and fades is *in ultimate nature* no different from something which comes into apparent being for a longer period and then fades. The time period is irrelevent from an ultimate point of view. And the cosmological time periods considered by Buddhist metaphysics make the time period of the existence of the current universe seem to be a mere instant. One Buddhist cosmic time period, for instance, is defined something like the length of time it would take a mountain the size of Everest to wear down if someone stroked it every billion years with a feather. I don't think there is an equation for calculating this but I imagine it's a pretty long time. In the light of the time periods conceived of by Buddhist metaphysics

(beginningless and endless time!) even universes are no more substantial than dewdrops, bubbles, dreams, lightening and clouds.

Figure 17 – Buddha expounding the Diamond Cutter Sutra

In the following extraordinary passage in which the Buddha and one of his chief enlightened followers Subhuti discuss the nature of the stuff of the universe it is clearly indicated that there is not one atom of REAL solid material MATTER anywhere. The Buddha is addressing Subhuti:

"And again, O Subhuti, if a son or a daughter of a good family were to take as many worlds as there are grains of earth-dust in this sphere of a million millions of worlds, and reduce them to such fine dust as can be made with immeasurable strength, like what is called a mass of the smallest atoms, do you think O Subhuti, would that be a mass of many atoms?"

Subhuti said: "Yes, Bhagavat, yes, Sugata that would be a mass of many atoms. And why? Because, O Bhagavat if it were a mass of many atoms, Bhagavat would not call it a mass of many atoms. And why? Because, what was preached as a mass of many atoms by the Tathagata, that was preached as no-mass of atoms by the Tathagata; and therefore it is called a mass of many atoms. And what was preached by the Tathagata as the sphere of a million millions of worlds, that was preached by the Tathagata as no-sphere of worlds; and therefore it is called the sphere of a million millions of worlds. And why? Because, O Bhagavat, if there were a sphere of worlds, there would exist a belief in matter; and what was preached as a belief in matter by the Tathagata, that was preached as no-belief by the Tathagata; and therefore it is called a belief in matter." [35]

The question that the Buddha (Bhagavat, Sugata, or Tathagata) is posing is: if it were possible to reduce the material world, in fact billions of universes, to the smallest possible 'particles' or 'atoms', would these actually be inherently existent REAL bits and pieces of actually independently existing material 'stuff'?

The answer is that although the Buddha has to teach in the 'conventional' world as if such atoms exist because they do indeed *appear to exist*, from an *ultimate and absolute point of view* no such

entities exist as inherently existent bits and pieces of reality. To suggest that inherently existent 'sphere of worlds' exist as REAL independent entities would be to suggest that inherently existent 'matter' really exists, but from a ultimate point of view such 'stuff' does not exist. Here the Buddha anticipated Stapp's assertion that "no brain, body, or anything else in the real world is composed of those tiny bits of matter that Newton imagined the universe to be made of" [36], by two thousand five hundred years:

…that which is a particle of earth was taught by the Tathagata as not being a particle; therefore it is called 'particle of earth.' That which is a world system was taught by the Tathagata as not being a world system; therefore it is called a world system.[37]

Although particles of earth (which means 'material particles') and world systems are '*called*' 'particles' and 'world systems', in ultimate reality rather than 'conventional' 'seeming' reality they are not inherently such things! As the Buddha further tells Subhuti:

…grasping a solid thing is itself a convention, that dharma [stuff] does not exist as expressed, yet it is grasped by ordinary childish beings.[38]

In other words only 'childish beings', who have not been told about or have not discovered the ultimate nature of phenomena, grasp on to an immature belief in REAL material stuff.

Why might a Professor of Physics who has studied the nature of what Zurek describes as quantum 'dream-stuff', which is not material stuff, of quantum reality still grasp on to such immature notions? Well, in an earlier part of the Sutra the Buddha tells Subhuti:

Upon this sutra being explained, those sentient beings who are unafraid, unterrified, and will not become terrified will be most astonishing.[39]

Indeed a great many people are at least disturbed, and some are afraid and terrified, by the vision of a really empty and illusory reality. Recall Heisenberg's remark about how could reality be so 'absurd.' The following observation is from physicist Robert Oerter's *The Theory of Almost Everything*:

Can we really believe a theory that is this crazy? After all, my body is made of protons, neutrons, and electrons. Am I to believe that every time I walk from the couch to the refrigerator, my electrons make virtual trips to Hawaii, the Bahamas, and Mars?[40]

And he quotes Richard Feynman, someone who Cox seems to think believed in inherently real quantum particles dashing about all over the universe:

It is not a question of whether a theory is philosophically delightful, or easy to understand, or perfectly reasonable from the point of view of common sense. The theory of quantum electrodynamics describes nature as absurd from the point of view of commonsense. And it agrees fully with experiment. So I hope, you can accept nature as she is - absurd.[41]

Such opinions are wildly at variance with Cox's 'plumping' approach to quantum theory. And an important question raised by such opinions is: what exactly is 'absurd' about the quantum situation? It is only 'absurd' to some-one who expects the world to be made of little Lego-like units of 'matter,' and therefore thinks in terms of inherently real 'particles' simultaneously rushing about everywhere in the universe at every moment in time.

There are still a many within the scientific community who are desperate to, as Zeilinger puts it, "save pre-quantum viewpoints, particularly the obviously wrong notion of a reality independent of us."[42] Coming to terms with the quantum vision of an ultimately immaterial universe within which awareness and consciousness is the primary ontological foundation and *reason for existence* is for many just too outlandish and challenging. Such people seem to resist the conclusion *whatever the evidence might be.*

Furthermore, people resistant to the vision of an interconnected world which has its roots in a deep, profound and ultimate 'empty' realm of universal awareness tend to dismiss any evidence for phenomena which do not coincide with their materialist prejudices, sometimes without even bothering to look at it. Recently, for instance, Rupert Sheldrake has designed and carried out experiments which certainly suggest a case for the existence of a 'normal' level of telepathic communication between dogs and their owners and mothers and their babies. Sheldrake tells us that his research has:

…led me to see telepathy as a normal, rather the paranormal. phenomenon, an aspect of communication between members of animal social groups. The same principles apply to human telepathy, and I have investigated little explored aspects of human telepathy, such as telepathy between mothers and babies, telephone telepathy (thinking of someone who soon afterwards calls) and email telepathy.[43]

However, his research is dismissed by materialist scientists on the basis of the materialist dogma that any phenomena must be a result of the machinations of mindless matter. Sheldrake says about the dogmatic attitude of the materialist worldview, which takes its stand on the unproven belief in fundamental mindlessness:

What we're dealing with here is … pseudo-science. It's propelled by this very deep belief system and because they're so sure they're right, so convinced that the materialist world view has to be true and that it's equivalent to science and reason, then there's not really much point in wasting time on evidence you know in advance is false.[44]

Because of this fixed and immovable belief in ultimate mindlessness materialists don't bother to examine the evidence. And Sheldrake is correct when he says this amounts to 'pseudo-science', although materialists generally use this term for non-materialist viewpoints, because a foundational principle of the scientific method is to examine and evaluate the evidence!

Phenomena such as telepathy, which are generally considered to be 'paranormal', of course, are considered by materialists as impossible as a matter of faith. But such phenomena are asserted by Buddhism to be 'normal' for certain types of beings who have developed their minds sufficiently. In the Diamond Cutter Sutra the Buddha tells Subhuti that:

…as many sentient beings as exist in those world systems, I totally know their continua of consciousness of different thoughts. Why is that? Subhhti, because a so-called 'continuum of consciousness' is that taught by the Tathagata as a non-continuum. Therefore, it is called a 'continuum of consciousness.' Why is that? Subhuti, because past consciousness does not exist

as an observable, nor does future consciousness exist as an observable, nor does present consciousness exist as an observable.[45]

Because consciousness itself is 'empty', it extends in an interconnected manner throughout the universe, just as Cox says that 'quantum particles' do, and, because of this, enlightened beings, according to some forms of Buddhism, have access to all the thoughts of all sentient beings. Much lesser degrees of telepathy are said to be possible for human beings who have developed their meditation skills to an advanced level.

In his book *Embracing Mind* the Buddhist philosopher Alan Wallace has written that:

One of the most controversial areas in spirituality is the paranormal. Under the rubrics of "magic" and "witchcraft" Christianity condemned this "supernatural" realm as sinful and demonic. Following in these footsteps, science denied the existence of the supernatural and miraculous, leading inevitably to skepticism about the nature of the mind as anything other than a property of matter. Buddhist contemplatives claim that the realization of primordial consciousness, when preceded by the perfection of shamatha [deep focused meditation], reveals limitless internal resources for various kinds of extrasensory perception and paranormal abilities. Among these are remote viewing or clairvoyance, clairaudience, knowledge of others' minds, precognition, and other such skills, including the power to mentally control the four elements of earth (solidity), water (fluidity), fire (heat), and air (motility).[46]

Wallace goes on, both in this book and elsewhere, to suggest that the existence of such abilities should be investigated scientifically rather than dismissed on the basis of materialist prejudice.

As we shall see, there exists at the moment a great deal of evidence for phenomena such as telepathy. And the evidence for reincarnation is so striking that the hardened sceptic Sam Harris said of the evidence for reincarnation presented by Ian Stevenson in his books such as *Where Reincarnation and Biology Intersect*, which presents striking evidence linking recall of past lives by young children who have birthmarks that correspond to recalled violent deaths in the previous life[47], that "either he is a victim of truly elaborate fraud, or something interesting is going on."[48] Furthermore it can be shown that such phenomena are entirely consistent with quantum theory. Cox's assertion that quantum theory rules out such "wishy-washy drivelly hippy woo-woo", apart from verging on the adolescently offensive, is actually contrary to the evidence.

When I was researching on the Internet for material for this chapter I came across a snappy entry on the 'Headline Superheroes' website titled 'No woo-woo, just Cox' which referred to Cox's closing statement:

> There is no woo-woo. Just beautiful physics. Thank you.

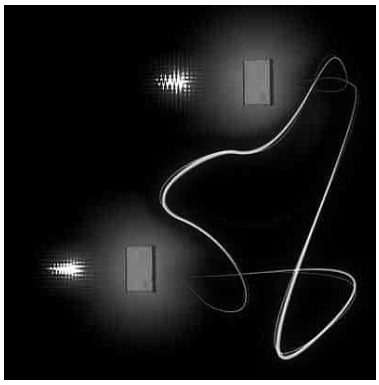
The website writers ask:

> Do you think that he knows that 'woo-woo' means vagina?

In conclusion he writers of this Internet entry, beautifully observe regarding Cox's choice of word:

Every electron in the Universe is simultaneously wincing.[49]

But electrons and sentient beings who care about the truth should not be wincing just because of Cox's injudicious choice of a word of abuse for views he mistakenly and dogmatically wants to undermine, but also for the fact that he chooses to try and undermine such views by incorrectly representing the evidence.



Two diamonds separated by about 15 cm have been put into a state of quantum entanglement.[50] This is the entangled state, for which neither the statement 'this diamond is vibrating' nor 'this diamond is not vibrating' is true.[51]

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