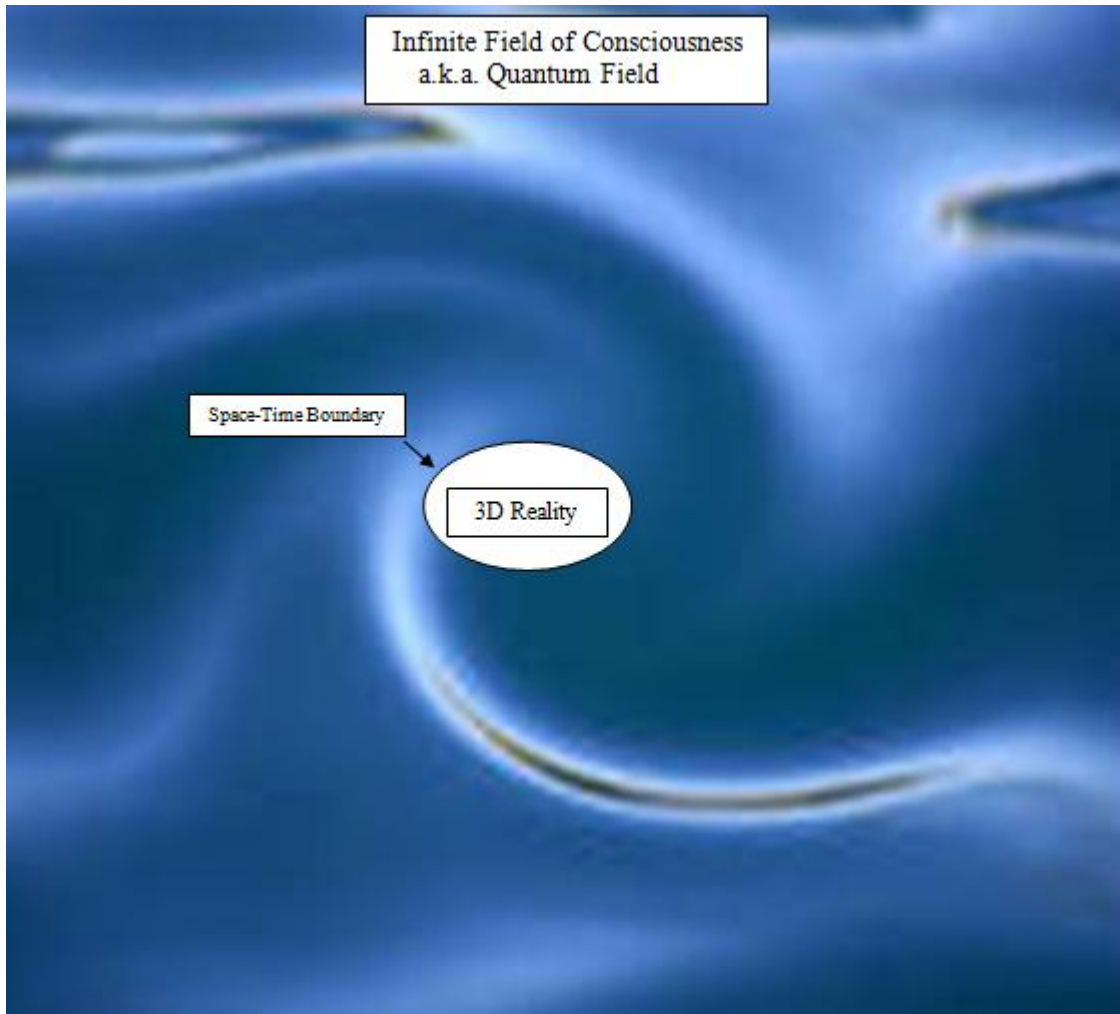


## Goswami's Quantum Philosophy I\*

Traditionally science and the educated public have held a Newtonian view of the world, which is in most respects a common sense view rooted philosophically in materialism. The materialist model is reductionist and holds that all macro phenomena can be reduced to the basic building blocks of matter, i.e. atoms. The quantum model superseded this model nearly a century ago. However, the materialist model was not supplanted but subsumed. One can think of the materialist model as a special case subsumed within the quantum model, which works well enough for many purposes but has been shown to be capable of only inaccurate approximations when tasked with describing the reality underlying the world and indeed the universe.

By way of analogy, think of a computer with a huge amount of RAM or working memory. Within this "working memory" there is nestled a small reserved area, which might be thought of as having a shell that partitions it off from the rest of working memory. Within this reserved area there is a self-evolving virtual reality program running. The program has to follow certain rules, which impose limits on what it can produce but still allows a number of degrees of freedom for its operation. From the sheltered perspective of the virtual reality program, the reality created by the program is all there is and the vast field of "working memory" within which it runs goes undetected. Think of the huge "working memory" as the unified field of consciousness, the shell around the reserved area as space/time, the self-evolving virtual reality program as the material model of reality and the rules that govern the operation of the program as classical (Newtonian) physics (**see Figure**, next page). With the advent of quantum physics, cracks have been opened in the shell. Through these cracks in the shell, the inhabitants of this world are beginning to get glimpses of a broader and deeper perspective on reality.

To appreciate the quantum perspective one needs to look at its impact on the defining aspects of the materialist model. The first aspect is *causal determinism* or the hypothesis that the world is a machine like a mechanical clock. Events proceed in a linear fashion, where A is the antecedent for B and B is the antecedent for C and so on. In other words classical determinism requires the identification of the originating cause and the end result. Experimental studies in quantum physics demonstrate that the exact position and velocity of an electron cannot both be known. In the Newtonian model, classical determinism depends upon being able to predict exactly both initial position and initial velocity. If things cannot be predicted with precision, classical determinism is out the window because the beginning point for the causal chain can never be known. Thus, all one can do is create probability distributions (bell curves) for both variables and identify probable values for the variables. The two distributions of values together represent a wave of possibilities. Heisenberg, one of the co-founders of quantum mechanics, expressed this finding in his now famous *uncertainty principle*. What is left is *statistical determinism*.



Why don't we experience the effects of statistical determinism in everyday life? Planck's constant  $h$  fixes the scale at which quantum effects are large. Fortunately,  $h$  is small, which means that quantum effects are only "large" and easily observed effects at the micro level. The small value for  $h$  hides quantum effects at the macro level. However, even macro objects have been demonstrated to retain some aspect of the wave of possibilities from which they collapsed. The wave aspect of a collapsed possibility continues to spread out over its probability distribution extremely slowly. Collapsed waves or objects (comprised of particles) are still governed by statistical determinism but the collapsed wave spreads so slowly that its inherent uncertainty can be ignored for all practical purposes. However, even though it is hardly detectable with the most sophisticated instrumentation, the continuing spread of the collapsed wave implies that there remains some connection to the wave of possibilities existing prior to collapse and material manifestation.

One way to think of this process might be to imagine that a wave of possibilities is like a continuous loop of images, where there are 6 images of A, 5 images of B, 4 images of C, 3 images of D, 2 images of E and 1 image of F. Thus, if one slows down the

loop until one image becomes the focus, you have the collapse of the wave of possibilities. Statistical determinism tells us that the image that becomes the focus is most likely to be image A ( $p = .30$ ) but could be image F ( $p = .05$ ). The loop (wave) has taken on the appearance of a single frame (particle) or collapsed possibility wave (see **Figure**, next page). However, recall that one has only slowed down the loop, not frozen it. Thus, the loop is still progressing but in very slow motion. Whether you or other observers will ever detect this slow movement depends upon how long and with how much precision you observe the image. Even though one now observes only a single frame, that frame still retains a “hidden” connection to the loop. This analogy also illustrates the difficulty of identifying a linear chain of causation within a loop (wave of possibilities).

The second aspect of the materialist model is *continuity* or the hypothesis that all change is continuous. Experimental studies confirm that atomic energies exist at discontinuous energy levels, which are fixed. Thus, an electron cannot exist at intermediate energy levels residing between fixed levels. When an electron changes orbits, which are at fixed distances from the nucleus, it goes from one discrete energy level (orbit) to another in a single quantum leap. The electron’s change in orbit provides evidence for spatial discontinuity. This is further illustrated by the phenomenon known as quantum tunneling. This can be observed in transistors in which an electron disappears from one side of a barrier and reappears on the other side without passing through the barrier. More concretely, think about standing with your back to the wall of an empty room. You look to your left and there is your mother standing against the wall to your left. You look to your right and your mother is now standing against the wall to your right. You had a clear view of the entire room and you never detected your mother’s transit from the wall on the left to the wall on the right. The move was not a progressive transit of space over time but instantaneous. Your mother simply disappeared from one location and reappeared at a different location.

The third aspect is *locality* or the hypothesis that all effects and their causes occur in space with a finite velocity over a finite amount of time. Before quantum mechanics, all influences were assumed to be local, i.e., taking a certain amount time to travel through a certain amount of space. Think about your mother walking from one side of the room described above to the other side. However, in quantum mechanics the discontinuous collapse of a sprawling possibility wave is instantaneous and therefore nonlocal. Think of your mother as a wave of possibilities and one of those possibilities is that she will manifest on the right side of the room. When that possibility is collapsed, your mother instantly materializes on the right side of the room. A possibility wave exists in transcendent potentia, that is, outside of space and time, which is why when it collapses and becomes manifest within space-time, the effect is instantaneous. Nonlocal correlation (Einstein’s spooky action at a distance) between quantum objects has been experimentally verified and confirms that a transcendent domain is part of reality, which contradicts the locality assumptions of the materialist model and affirms *non-locality*.



**Wave Form**



**Particle Form**

### **Collapse of Probability Wave**

The fourth aspect is *strong objectivity* or the hypothesis that the material world is independent of observers (consciousness). However, as we've seen, the wave is transcendent and the particle is manifest. What then causes the transition from wave to particle? It is widely accepted that observation or measurement produces the collapse. Mathematician John von Neumann suggested that the operative property in observation or measurement is consciousness since an instrument cannot observe anything. Think of a telescope pointed at the moon. Is the telescope observing the moon? Or is it the astronomer looking at the moon through the telescope that is observing the moon. While not conclusively demonstrated, it appears that consciousness chooses where a wave will manifest as a particle in a particular event. Thus, how can there be strong objectivity in physics if consciousness has the power to choose material reality? If consciousness causes wave collapse, the material world (collapsed waves) cannot be independent of observers.

The fifth aspect is *reductionism* or the hypothesis that every material phenomenon can be reduced to its essential components. If reductionism is correct, then all of physical reality can be reduced to elementary material particles. In other words, everything arises from the **bottom up** as aggregates of material particles coalesce into ever-larger objects, including us. However, if consciousness is needed to collapse waves of possibility into material actuality (particles), which is **top down** causation, one has mutually exclusive causal mechanisms. In such a case, reductionism ultimately fails.

In the materialist model, phenomena such as consciousness are considered as epiphenomena or secondary properties arising from matter. Thus, all non-material phenomena such as mind, thought and consciousness can ultimately be reduced to matter by considering them epiphenomena of the brain. From this view arises a dualism such that mind and body are from different classes of phenomena, i.e., a difference in kind. However, if consciousness has the causal power to determine material reality, how can it be a derivative of matter? The long, progressive build up to a material brain capable of producing consciousness could never take place, if consciousness is required for the collapse of a possibility wave into a particle of matter to begin with. Thus, while reductionism and bottom up causation may be a useful way of looking at phenomena within the context of the classical worldview, its utility is limited when it comes to understanding the ultimate nature of reality.

Thus, quantum physics has demonstrated empirically that the principles of *causal determinism*, *continuity* and *locality* do not in the final analysis hold up. Quantum physics has also raised serious doubts about but not yet empirically demonstrated that *strong objectivity* and *reductionism* are likewise ultimately invalid. These principles do work reasonably well in that subset of quantum reality that we think of as Newtonian or classical physics, which underlies the material model of reality. They just aren't suitable for grasping the underlying nature of reality.

Given the above, what are the implications for how we view the nature of reality? Amit Goswami, emeritus professor of physics at the University of Oregon, offers some thoughts on this question. The implications that he draws are radical and generally considered to be extreme by many physicists because they turn the world upside down. According to the interpretation of Goswami, Consciousness is the ground of all being and matter exists only as a possibility within consciousness. Thus, there is nothing but consciousness or as some might say, God is all that is. You and I are material manifestations of God as are plants, bacteria, insects, fish, animals, chairs, shirts, houses, shovels, pistols, water, earth, planets and stars, ad infinitum. From this one might jump to the conclusion that all things are interconnected. However, Goswami argues that this is an over interpretation and that any two things are only potentially interconnected. They do, however, always have in common their origins in the unified field of consciousness.

Goswami says that dualism is an illusion. The belief that the mind is distinct from the brain or that spirit is distinct from matter or that man is distinct from God is all an illusion. There is only the unified field of consciousness. Everything is a manifestation of

consciousness. Consciousness permeates and fills our being, and our brain is a conduit for waves of possibility. When self focuses upon a possibility, wave collapse takes place and there is awareness of the object of the choice. The presence of awareness implies a subject-object split between the subject and the object. One might ask: if we can affect reality by our choices, why isn't there constant conflict and chaos? For example, everyone who buys a lottery ticket would choose to have the winning number but obviously everyone's choice can't prevail. Goswami suggests that the reality that is commonly perceived is created by what might be thought of as a consensus of consciousness. We have the freedom to make choices that affect us but not consensus reality. We can't personally change consensus reality.

The apparent split responsible for dualism is the product of the dependent co-arising of the subject that chooses and the objects of awareness. Herein objects refer to anything that is perceived as "not me" and can include ideas or thoughts as well as material objects. The consciousness from which both the subject and the object arise identifies with the subject pole of the dyad. This gives rise to the mistaken perception that there is a subject independent of objects. This mistake or illusion is necessary in order for experience, as we know it, to occur. The basis for this mistaken perception or illusion is self-reference, which is not unlike the circular meaning in the statement "I am a liar." In this sentence the predicate defines the subject and the subject redefines the predicate, the predicate then redefines the subject, setting up an endless oscillation. This is called a *tangled hierarchy*. The meaning in this statement seemingly forever eludes us, as does the recognition that I (ego) and it (object) arise from the same source.

For Goswami the subject-object split is an epiphenomenon. If we don't identify with the subject in the subject-object dyad we can escape the illusion. This state of consciousness is what the American mystic Franklin Merrell-Wolff called *introception*, which denotes consciousness without an object (and thus also without a subject). To experience a state of pure consciousness is to achieve enlightenment or bliss consciousness. The illusion of self develops as choices are made, memories are formed and habitual responses are established and reinforced. As this process unfolds, the range of free choice constricts and consciousness repeatedly collapses conditioned outcomes from among the myriad possibilities actually available. Thus, personal identity or what we call ego is created through a conditioned pattern of perception and response. Habitually adhering to this conditioned pattern in making choices is what the psychic Edgar Cayce referred to as following *the path of least resistance* or collapsing for oneself what is the most probable outcome or possibility. The freedom to make creative choices is always present but seldom exercised. Understanding that we have this freedom and the exercise of it allows us to step beyond ignorance and discover our true nature.

*\*This interpretation of Goswami's thinking is based solely upon my understanding of Goswami's writing and is largely based upon his book titled The Visionary Window, which I recommend to anyone who wants to pursue his reasoning more deeply.*

David Center, PhD