

The Quantum God:  
An Investigation of the Image of God from Quantum Science

By

Meaghean H. Richardson

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Approved: Dr. Anne Marie Dalton  
Supervisor

Approved: Dr. Mary Hale  
Reader

Approved: Dr. Magi Abdul-Masih  
Examiner

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## ABSTRACT

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This thesis is an investigation of the image of God arising from understandings of quantum science and argues that it enhances ideas about God. It considers the significance of religious interpretations of quantum science and briefly examines the case of Christian theology and God's actions in the world. The nature of quantum phenomena requires the use of imagery likened to that used in many mystical and religious traditions. Using a multivalued approach, I give equitable consideration to multiple scientific and theological interpretations to describe the God-concept presented by sources writing on the mystical implications of quantum science. The quantum demands an intellectual and academic openness, requiring the use of resources outside of science, and pushes for a holistic approach and a transition to a postmodern paradigm. Therefore, the quantum is said to be a re-enchanting force, calling for a re-evaluation of the spiritual dimension in our overall understanding of reality.

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## INTRODUCTION

This thesis investigates the relationship of quantum physics to understandings of God. Quantum physics, also known as the new physics, is the scientific study of the behaviour of subatomic particles, such as photons, electrons and protons. Their behaviour drastically defies the logic of Newtonian physics and requires its own model of understanding. The interpretations used in this paper arise from a mystical perspective. Such a perspective refers to the esoteric and non-empirical, or beyond-empirical implications of the scientific findings of quantum investigations. The inability of the science to fully explain itself calls for the use of analogy, which likens the world of the quantum to that of mystical, spiritual or religious traditions. Investigation of this topic is crucial, as it opens a new way to deepening the relationship between religion and science.

Quantum theories began to garner attention shortly after their first publications in the early twentieth century. A number of scholars have interpreted quantum science to support the notion that the universe has a mystical quality, referring, as above, to the esoteric nature of many interpretations of the science. The science seems to suggest many concepts that have existed within esoteric spiritual traditions for millennia (Goswami, 1995). These mystical undertones of quantum physics have provided a hermeneutical space within the current scientific understandings of the universe. The transcendent, the numinous, the divinely enigmatic are all given more support through these mystical implications, as a collective referred to as quantum mysticism. References to this term have been noted since the inception of quantum explorations, as scientists attempted to grapple with the strangeness of their findings. It has been subsequently perpetuated with

works such as Fritjov Capra's 1975 work, *The Tao of Physics: An Exploration of the Parallels Between Modern Physics and Eastern Mysticism*, and Michael Talbot's *Mysticism and the New Physics* (1993). Some current interpretations have been credited not only with opening a space for the transcendent in the empirical world but also with creating images that are prone to a theological disposition.

Today there are many prominent physicists and theologians who contend that interpretations of the quantum present the best bridge between science and religion that the post-Newtonian world has seen (Klein, 2002). One of the modern philosophical holy grails has been this bridge, the reconciliation of science and religion<sup>1</sup>. Such a bridge is thought by many in the Western world to be an idealist dream<sup>2</sup>, especially of late, in light of the New Atheism movement<sup>3</sup> and pervasive secularism. It is a well-established fact that the turn to materialism in the West has resulted in the relegation of religious knowledge to the realm of subjective feeling. This has pushed mysticism, and the divine into the corners of knowledge, labeled as non-empirical and therefore superfluous.

Quantum physics, as it is interpreted by some, has led however to the acknowledgment by certain scientists and religionists that the nature of the universe may indeed include a non-empirical reality (Schäfer, 2006; 2008). It is thought that this mysterious reality or aspect of the universe is comprised of fields of in-formed energy, or consciousness according to Amit Goswami. Out of these understandings emerges an image of a holistic energetic intelligence, which some, like Ervin Laszlo and John Denker, are calling the closest-ever theory to a scientifically supported notion of God.

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<sup>1</sup> See *Bridging Science and Religion* (2003), edited by Gaymon Bennett and Ted Peters.

<sup>2</sup> See works by Bertrand Russell.

<sup>3</sup> This is a socio-political movement in favour of secularism and atheism, supported by those like Richard Dawkins and Christopher Hitchens, a self-professed antitheist.

Moving the divine from the dusty corners of illegitimacy, literature on quantum mysticism is providing an empirical base for the existence of a kind of transcendence or divinity that may exist within and around our entire universe. As this thesis will show, quantum physics invites the building of images in order to express the complexity of its theories. Those interested in mystical or religious connotations of these images consider them to relate to a God and God's action in the world. Goswami refers to this as a re-enchantment, bringing God and the divine back into the foundations of our reality (1995)<sup>4</sup>. Consequently, theology is being called to account for the new attempts of science to describe God and/or the sense of the supernatural.

According to quantum mysticism, the ultimate questions posed by scientists and theologians seem to be pointing towards very similar answers, flipping modernist conceptions of the binary science-religion debate on their heads and revealing mutual destinations of both streams of thought. Physics, considered by most to be nothing but cold empirical calculations and observations of inanimate matter, has found itself exploring the very essence of the non-empirical, of consciousness, and of life itself as it delves deeper into the most fundamental aspects of our universe. Hence, in an ironic and, as will be discussed, paradoxical way the empirical is seen to explore the non-empirical.

The quantum God-concept is presented as an engaging spiritual force in a scientific framework, challenging the supremacy of materialism and the disenfranchisement of spirituality and religion in the West. Accordingly there emerges what some refer to as quantum philosophies dealing with this critique of modernity (Omnès, 1999). It can also be argued that many texts exploring these philosophies engage

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<sup>4</sup> The probabilistic and rather idealistic nature of the universe put forth by some quantum theorists, highlighting the pivotal role of consciousness and participation on the part of the individual, is represented as an enlightening, re-enchanting force.

and motivate the reader, as their core impetus, with a call to a personal spirituality and a deep individual moral and ecological responsibility. Such engagement suggests powerful support for transformation and the broadening of horizons. It is this potency for a real-world impact that impelled the exploration of what issues are raised by such findings and interpretations in regards to spirituality, religion, and the current Western milieu.

Thus my aim is to investigate the image of God arising from the nascent field of quantum physics and the spiritual and religious issues developing around such ideas. I ask: What is the over-arching image of God suggested by quantum science? How does it relate to an established image of God, like that of the Christian God? What is its significance? My approach is characterized by the prominent assumption of those writing on the subject that such interpretations could have incredibly profound implications based on the reimagining of God-concepts, what Amit Goswami calls “the re-enchantment of the person” (1995), and a paradigmatic shift to a quantum perspective (Denker, 2010). These concepts will be explored further in this thesis.

When dealing with any quantum phenomena, with indeterminacy at its core, as we will see, a shift from conventional thinking is required. In light of this, I use a multivalued approach to account for the image of God developing from the varied interpretations within quantum mysticism and extensive literature review to investigate the implications of such a concept. As the Newtonian and the quantum co-exist with equal validity, this thesis investigates what happens when this multivalued approach is applied to the many interdisciplinary theories used to understand the quantum on the assumption that they all have some validity

Since validation or comprehensive clarification of such mathematical and scientific theories is beyond the scope of this study, as well as outside my own expertise, this paper is limited to an analysis of the interpretations of select quantum theories that infer the existence of a God-like phenomena and the contributions of quantum scientists to the discussion of God. Neither is it the purpose of this paper to argue in favour of any one spiritual or religious interpretation, but rather to highlight the evidence put forth by those who argue that it is now possible to support the existence of an empirically based God-concept and to explore its spiritual and religious implications. The examination in chapter four of how these theories might inform the Christian notion of God in no way should be taken to imply that understandings of Quantum Physics have implications for Christianity only. The focus on one example is governed only by the limitations of time and space for this study. Nor is it possible or necessary to the thesis to judge the scientific accuracy of the interpretations used. It is the interpretations of the science for the understanding of God that is significant not the nuances of the scientific arguments themselves. Thus it is assumed that the scholarly interpretations used are credible.

With this understood, my paper will present some of the main interpretations of quantum theory and discuss the interpretations within quantum mysticism, highlighting some prominent sources on the subject. Chapter two will examine a logical approach designed in light of the quantum in relation to the multivalued methodological approach used to compose the quantum God-concept. The images of God that arise from the interpretations of quantum science are then briefly described and defined in chapter three, then compared to the Christian God to emphasize the parallels in chapter four. I will conclude with some considerations for further study in light of this quantum perspective.

CHAPTER 1—QUANTUM PHYSICS, QUANTUM MYSTICISM  
AND PROMINENT SOURCES

Quantum Physics

The works of some of the world's greatest scientific minds have built an understanding of the foundations of our universe through exploring the smallest known pieces of matter, called *quanta*. Such well-known persons as, Albert Einstein, Erwin Schrödinger, Niels Bohr, David Bohm and Werner Heisenberg have for the most part defined the field of quantum science. These scientists are responsible for producing famous concepts like those of Einstein's Theory of Relativity and Heisenberg's Uncertainty Principle. Their contributions have been studied for decades and, along with most subsequent quantum explorations, have been credited as revolutionary. Although much is yet to be discovered and deciphered, the findings of quantum physics currently hold, among others, three basic principles: duality, uncertainty and entanglement.

Duality

Wave-particle duality, also referred to as complementarity, is, in lay terms, the phenomenon of sub-atomic particles and energy waves, or wave-functions, existing as the same phenomena only perceived in different ways (Ward, 2005). Particles tend to behave like a wave until observed through sophisticated means of technical measurement; this is known as the observer effect<sup>5</sup>. This is described as the wave-function existing in a state of potentiality, wherein the quanta could be thought to exist in all possible states until it is observed, "collapsing" from a state of potentiality to actuality (Laszlo, 2007).

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<sup>5</sup> The following video from the film *What The Bleep Do We Know!?: Down The Rabbit Hole* explains The Double Slit Experiment, also known as Young's Experiment, which exemplifies the observer effect. <https://www.youtube.com/watch?v=DfPeprQ7oGc>

Some interpretations of such quantum phenomena hold that an observer may be necessary for all physical phenomena to arise, since wave-functions do not collapse to produce particles unless somehow observed. This is another dualistic characteristic of the quantum known as the observer-observed split. This duality refers to both wave-particle complementarity and the observer-observed split and is mathematically formulated, self-consistent and tightly constrained, differing from some previous dualities. Dr. Stanley Klein (2002) contends that the phenomenon of duality is the most important feature of quantum physics. The act of observation and the integral role of consciousness become paramount to this investigation, as will be seen in subsequent sections.

### Uncertainty

The Uncertainty Principle, as described by Heisenberg, refers to the observation that one can know where an electron is, or what it is doing, but never both at the same time: it is thought to be in a cloud of probability (Polkinghorne, 2002) or a superposition of states. The importance of uncertainty and its implication of a non-empirical aspect of reality will be covered in more detail below. Quantum non-locality, the idea that particles can exist or interact in more than one place at one time or blink in and out of existence, is also known as quantum teleportation (Laszlo, 2007). This characteristic supports this uncertain nature as well and is further reflected in the last principle of entanglement.

### Entanglement

Entanglement refers to the phenomenon of subatomic particles retaining a strange connection after interacting; when a change is made to one particle, the other instantly reflects the same change regardless of distance in space or time (Ward, 2005; Clegg, 2006; James, 2007; Schafer, 2008). If the Big Bang scenario is upheld, all matter and

energy was most likely at one point deeply connected and condensed into a singularity. It can be extrapolated from this that all matter and energy in the known universe may retain some sort of connection at the quantum level. This understanding brings a new holistic approach into play in an arena that traditionally looks at the pieces rather than the whole.

### Fields

These principles support the concept of quantum fields. Deep in the subatomic world of the quantum, everything seems to become one kind of thing. In theoretical quantum physics there is a concept known as quantum field theory. In this framework, particles are treated as excited states of underlying fields of energy, which Fred Alan Wolf envisages as an underlying invisible matrix (2008). Such fields are a type of what physicists call virtual states. These virtual states are empty and as such have no empirical properties and nothing to observe. Yet they have “the potential, or *potentia*, to express their logical order in the empirical world in a quantized and a priori precisely predictable way” (Schäfer, 2008. p. 331), making them somehow very real. Stephen Barr writes,

Among the many beautiful things Quantum Theory has given us is a unification of particles and forces. Faraday saw that forces arise from fields, and Maxwell saw that fields give rise to waves. Thus, when Quantum Theory showed that waves are particles (and vice versa), a deep unity of nature came into view: The forces by which matter interacts and the particles of which it is composed are both manifestations of a single kind of thing—‘Quantum fields’ (2007, p. 22).

### Quantum Theories and Interpretations within Quantum Mysticism

To date, the data is leading to the conclusion that quantum systems are inherently interconnected and evolve in a state of not actuality, but potentiality (Schafer, 2008). As Klein (2006) writes, this state of potentiality suggest that “quantum entities, of which we and everything around us are made, are not quite real but are ‘standing in the middle between the idea of a thing and a real thing,’ as Werner Heisenberg wrote” (p. 570). Such an analogy is necessary when attempting to comprehend the nature of what scientists call the quantum. As it is beyond explanation by mathematics alone, it therefore demands some form of analogy and philosophical inquiry to better understand and explain such abstract concepts. As quantum phenomena make up the very foundations of our universe and such phenomena are not of actuality yet somehow become so, two main questions arise: What is ultimately there and what is it like? These are the concern of a traditional branch of philosophy known as metaphysics, the study of the nature of reality and existence, which will be discussed in more detail in chapter two.

This metaphysical inquiry is paramount to the investigation of God-concepts within quantum mysticism. Many in the field argue that the multiple metaphysical perspectives exemplify the need for consideration beyond just the science, which is considered a blasphemous stance in the rigid pragmatic world of scientific materialism. Nonetheless, the probabilistic nature of the quantum invites metaphorical and metaphysical language, further opening the way for mystical interpretations of the scientific data. Thus opening our entire material world to the realm of the spiritual, as in this light they seem to function on similar ground.

Using the wave-particle collapse mentioned above, the four main interpretations of quantum science, as outlined by Klein (2002), are very briefly summarised as follows:

1. The von Neumann/Stapp Collapse interpretation, which considers the wave-particle collapse to literally occur.
2. The Copenhagen interpretation, spearheaded by Bohr, which considers the wave-particle collapse to be metaphorical as opposed to literal.
3. The Splitting Universe interpretation, which suggests that there is no collapse at all, rather every time a measurement is made, each of the multiple outcomes produces a new universe and all coexist simultaneously.
4. The Bohm interpretation, which suggests that underlying our universe, is a hidden reality that deterministically guides its evolution.

The most interesting aspect of these interpretations is that they are all supported by the exact same data. Many view the ambiguity of multiple interpretations to be a negative characteristic of quantum theories, expecting a single interpretation to dominate.

However, to Klein (2002), it is the multiple, seemingly conflicting, or paradoxical, interpretations that are the beauty of quantum theory. Klein asserts that, seeing as how there is extensive experimental support for each and they give identical predictions, the array of interpretations encourages tolerance of divergent worldviews and opens the arena of scientific truth to the world of probabilities in which it exists.

Expanding upon the four main theories covered above, the mystical implications of these interpretations include the following:

1. Stephen Barr (2012) says the von Neumann interpretation finds that, as everything is not simply matter but some enigmatic form of energy that our consciousness

interacts with, there is then an element of the human mind that transcends all material laws in order to interact with the immaterial. He extends this logic by positing the possibility for a purely transcendent mind, which acts as an ultimate observer of everything.

2. Klein (2002) speaks to the importance of the Copenhagen interpretation's metaphorical observer-observed split and its "movability"; with so many conscious observers some questions arise, such as: Which one is really responsible for the collapse? Is it a collapse or just a vantage point, an angle of observation? Many authors wonder if Bohr considered such an interpretation as an epistemological theory or an ontological one; a matter of how we know or something that exists outside our knowing. It could be both; there could be an ultimate observer maintaining reality and interacting with our consciousness.
3. Although it is said that the Splitting or Multiple Universe interpretation rejects the idea of the observer split altogether, there still seems to be a dualistic interactivity. John Polkinghorne (2002) describes the observer as being acted upon by physical reality. The observer could be understood as being "cloned" into a parallel universe with each observation, or perhaps their angle of observation is collapsed into one universe. Consciousness thus becomes a multidimensional phenomenon, functioning beyond our physical reality.
4. In accordance with Bohm's theory, it can be inferred that the material world has its base in a non-material realm of an indivisible interconnected wholeness. This realm is represented by the sources writing on quantum mysticism as a sea of consciousness or pure abstract potentiality (Laszlo, 2007; Hagelin, 2011).

Further, Lothar Schäfer and Sisir Roy (2008) summarise the metaphysical interpretations of quantum findings as follows:

1) the discovery of a non-empirical part of physical reality in a realm of potentiality; 2) the emanation of the empirical world out of a realm of non-material forms; 3) the discovery that the nature of physical reality is that of an indivisible Wholeness – the One; and 4) panpsychism: the possibility that the One is aware of its processes like a Cosmic Consciousness (p. 1).

Keith Ward (2005) sums these up in three main ideas: Interconnectedness, indeterminacy, and idealism. The interconnectedness notion draws from quantum entanglement and non-locality, as indicated above. Indeterminacy stems from uncertainty and superposition; everything is a probability wave, which exists in a state of simultaneous infinite potentiality. The superposition model expresses the distinctive ability of quantum systems to:

...evolve in states in which a given quanta is in a state not of actuality but of potentiality. In such a state a particular property, such as the position in space, does not have a single actual value but a multiplicity (a superposition) of potential values (Schäfer, 2008, p. 331).

Finally, Idealism, also referred to as monistic idealism because it involves the reduction of all to one (Goswami, 1989; 1995; Stapp, 1993), holds that everything is consciousness. This idealism holds that consciousness is an ultimate part of reality, more fundamental than matter. Matter is then understood to be the outward expression of some sort of

consciousness (Ward, 2005). This has led to the development of a concept called quantum holism (Esfeld, 1999). The duality of the quantum is then a duality of objective and subjective vantage points, as the whole can be understood as an idealistic consciousness observing itself from varying angles.

As mentioned above, it is accepted by some that quantum fields of probable superposition may comprise a veiled non-empirical reality, which transcends the physical order (Ward, 2005; Schäfer, 2006; 2008) and, according to Ward (2005) “underlies the physical reality in which we live and move and have our being” (final paragraph). This transcendent reality is considered to be the source of all phenomena in existence. Because they are based on extensive scientific research, the three main principles of duality, uncertainty and entanglement, have led many to believe that the behaviour of energy in the quantum realm denotes a kind of intelligent functioning when consciousness is seen as explanatory (Goswami, 1995; Laszlo, 2007).

Goswami, expanding upon the theories of David Bohm (Jackson, 2002), claims that quantum fields are comprised of a kind of consciousness, or what Laszlo calls informed energy, together making up an ultimate mind-like field; a universal field of intelligence that is the place or substance out of which our empirical realm arises. This reality, realm, or state of energy has been referred to by many names, such as the One (Schäfer, 2006; 2008), the Unified, Quantum or Universal Field (Hagelin, 2011), the Great Field (Barr, 2007; James, 2007), the Akashic Field or A-Field (Laszlo, 2008; 2010), the Information Field (Laszlo, 2010), the Source Field (Wilcock, 2011) and the Divine Matrix (Braden, 2007). John Hagelin writes:

Over the past 300 years, modern science has systematically probed

deeper levels of nature's functioning, from surface macroscopic diversity to smaller and smaller time and distance scales. This inward march of the physical sciences has led to the progressive unification of fundamental force and matter fields, culminating in the discovery of the unified field—a single, universal, unified field of intelligence at the basis of all forms and phenomena in the universe. Millions of times more fundamental and more powerful than the nuclear force, the unified field is the ultimate source of the order displayed throughout the cosmos (Hagelin, 2011, p. 13).

The language used in this quotation is an example of how the descriptions of quantum discoveries are suggestive of what has traditionally been the subject of religions, mystical or esoteric teachings, and spiritual traditions throughout history. It suggests an ultimate fundamental unified immaterial intelligence.

Thompson (2002) claims that, “the functional patterns in nature are the same as the functional patterns in the internal, and ...external mind” (p. 354). However, using words like information, intelligence or consciousness can cause some discomfort; it is very difficult for some to conceptualize models of intelligence that are drastically different from our own human form of self-awareness. Yet, in the words of Rolf Jackson,

Research published by James Lovelock has provided evidence that there are phenomena in the earth's biosphere that can only be understood if one accepts the existence of a kind of meta-intelligence that causes entire ecosystems to act as if they are

intelligent. This has been popularized in the image of the living earth–Gaia (2002, p.11-12).

In fact, according to Gary Zukav (1979), it is speculated by some physicists, such as E. H. Walker, that all quantum mechanical processes may be conscious. According to this view, reality is more mind-like than matter-like and some sort of consciousness is the primary reality (Schäfer, 2006). This is where the notion of God enters the discussion.

Many physicist, meditators, and theorists would agree that there exists a common field referred to in religious texts as the Brahma, the Ground of Being or the Void that encompasses everything from the largest fields to the smallest particle. Bohm called it the superimplicate order. [James has] called it the Great Field.

Whatever the name it is the same. The Field is the superstratum of all creation, the all-pervasive, all-inclusive essence from which all is created and within which all exists. It is as close to the meaning of God as we get (James, 2007, p.131).

Here is the source of what has been called quantum mysticism. This analogical correlation of the non-empirical realm described by quantum science to that of the divine or mystical realm of spiritual and religious traditions from around the world has opened quantum science to interdisciplinary scrutiny, inviting theological inquiry.

#### Select Sources on Quantum Mysticism and the Quantum God-Concept

One of the most prominent sources on quantum mysticism is Amit Goswami. Dr. Amit Goswami is a theoretical quantum physicist and retired professor of theoretical nuclear physics having served at the University of Oregon since 1968. According to his

website (amitgoswami.org) he is a practitioner of “spirituality and transformation”, a self-proclaimed “quantum activist”, and the pioneer of a new paradigm he calls “science within consciousness”.

In his 1995 book *The Self-Aware Universe*, Goswami discusses the implications of quantum science. Goswami believes that quantum conclusions cut through material realism. Quantum objects can be at more than one place at one time, cannot manifest until observed as a particle, can jump through time to another place in space, can maintain relationships and react simultaneously to distant influences, and severely perplex physicists of every calibre. According to Goswami, these paradoxes can only be reconciled with what he calls a “science of consciousness”, based upon the findings of quantum physics. Goswami argues that an idealist science of consciousness is best equipped to deal with the quantum. This is what he calls Monistic Idealism, the philosophy that consciousness is fundamental to every phenomenon in existence. It caters to the idealist metaphysics of quantum objects, where consciousness is the agency of the wave collapse making real quantum waves of potential. Goswami asserts that Monistic Idealism is the most satisfactory philosophy uniting the mind-body paradox.

Goswami believes all religions carry an illogical dualism, as they act as bridges between this world and the transcendent. The metaphysics in the new idealist science, however, carries with it revitalising possibilities for religion to Goswami. Scientifically supporting a re-enchantment of the person as an active, creative force in the quantum whole. Ethics then become boundless, beyond culture, to a grander sense of responsibility to the world that is, in essence, us. It is a universe in which morality stems from unity and encourages conscious and respectful interaction with all things in the name of the whole.

In a similar way to Goswami, Ervin Laszlo, a Hungarian integral and systems theorist and philosopher of science, also released a comprehensive overview of the common ground recently established between quantum science and mysticism. Likened to that of Goswami's *Self-Aware Universe*, Laszlo's 2007 book, *Science And The Akashic Field: An Integral Theory Of Everything*, defines an idealistic Theory of Everything with the intentions of pushing for a new meaningful scientific worldview, re-enchanted by the implications of research into the quantum.

In *Science and the Akashic Field*, Laszlo argues that active and effective information, what he calls in-formation, links all things in the universe creating a field of information, what he refers to as the Akashic Field, or A-Field. Akasha is a Sanskrit word meaning "ether, or all-pervasive space" (2007, p.13). It represented the most fundamental and all-encompassing element in ancient Indian philosophy. What is known as the Akashic Record in Indian Philosophy is the enduring record of all that has ever happened in the universe.

Laszlo opens with an account of the physicist's theory of everything, String Theory, which holds that space, the universe is a network of nodes interconnecting at all points. He himself, however, holds a genuine theory of everything is beyond that of the physicists; it can be expressed only through analogy. He claims the theories and concepts in quantum science demand metaphors and metaphysics to understand. Fittingly, Laszlo aligns his theory with the necessary and available fables, or widely accepted metaphors, from science to describe the universe, in a scientific narrative, as an impossibly coherent structure in all scientific respects, biologically, physically, and consciously.

The coherent in-formed foundation, like Goswami's field of consciousness, is the cornerstone of Laszlo's theory. This coherence points towards an in-formed universe, a conscious quantum system of quantum systems. Using what he calls the parable of the sea, Laszlo, like many others in this field of study, likens the base energy field to an ocean of in-formed energy. Observed from different perspectives, waves are particles, or matter, or whatever possibility the observer's angle of observation entails. Laszlo outlines the poetry of the Akashic vision with this fundamental quantum fable of a sea consciousness: The oceanic in-formed "plenum" of the A-Field brings forth "microripples" and "megawave structures" arising from and vanishing into itself leaving further in-formed memories and articulations (Laszlo, 2007).

According to Laszlo this oceanic memory-filled Akashic mind structure addresses the brain-mind problem similarly to Goswami. He proposes panpsychism, wherein brain and mind are both quantum systems in nature, which is itself the conscious universe. This idea is similar to Goswami's basis for re-enchantment. Human consciousness is a part of a greater conscious whole; humans are intimately connected to the ultimate, or what could be called the divine. The universe is then a memory-filled field of ceaseless interconnecting aspects constantly informing, acting and interacting, with itself, which could be understood as the "self-realized mind of God" (Laszlo, 2007, p. 146).

In his 2010 book entitled *The Quantum God: Why Our Grandchildren Won't Know Atheism*, Dr. John S. Denker, a PhD quantum physicist for Bell Labs, outlines five main concept changes arising from quantum physics, which he contends are moving Western thought into a postmodern post-Newtonian quantum view of reality. They are summarised as the following: 1) Science no longer has nothing to say about God. 2)

Science has shown the existence of a reality the human mind cannot conceptualize; everything is speculative philosophy based on epistemological and metaphysical reasoning. 3) The universe is non-local; matter is a phenomenon of mind, the antecedent and transcendent force. 4) According to General Relativity, the universe is one whole, not just a collection of separate parts. 5) Love, the force of unity, and consciousness end the dualism of mind and body and point towards the reality of God.

Denker argues that investigations into the quantum world have led to the conclusion that consciousness could be the very foundation of our universe. Hence they suggest a world in which inanimate objects, such as molecules, are not dead or separate but quantum manifestations of the living conscious whole. This conscious whole represents what could be called God. According to Denker, God and the transcendent realm are the essence of nature, yet still constitute an ontologically separate observer beyond nature and human beings. Denker argues the human spirit is not just a part of the whole, but also an aspect of the one and only “ontic all”, a transcendent universal metaphysical entity. But while God is considered by many to be the best answer to ultimate questions, God does still remain a mystery. Denker chastises atheists for their belief that science knows or can explain all and, in accordance with his distaste for any exclusivist argument, he calls for openness to any possibility in our search for naming and defining our universe.

Denker believes that while the Bible, to which he himself adheres, is Christian scripture, nature as creation itself is also God’s scripture; an idea with threads in countless faith traditions. He says religious scripture can serve as a relational foundation between one and God’s revelation in nature, outlined by scientific exploration. Denker

argues that Love, another integral component to religion, in its unifying inter-relational and creative essence is a fundamental aspect of the universe, like time and space. Denker sees the Hebrew Kabbalistic concept of Neshama, meaning the inner and outer most Self and Love, the super soul, to be analogous to the intelligent unity of the quantum whole<sup>6</sup>.

Through quantum investigations into what is known as the zero-point vacuum field, the mathematical exploration into the void beyond the universe as we know it, Denker surmises that everything is mind flowing to matter and back again. Everything is to some degree our own mental creation. In each of us may live the power of this natural divinity, what some are calling the mind of God. Denker stresses, however, that the whole truth, as even science will admit, is unknown; and to know the possibility or even the remotest essence of God through the quantum worldview is not to truly know God. Denker holds, however, that it can and does provide opportunities for understanding that our life experiences may be touched by the transcendent divine, which he also believes can be seen as an engaging and transforming force.

Another work by Diarmuid O'Murchu, a Catholic priest of the Sacred Heart Missionary Order and a social psychologist, explores the metaphysics of certain interpretations of quantum theories and how they apply to human nature, our spirituality and how we ought to live our lives. Over the last twenty years O'Murchu has written over a dozen books on postmodern perspectives of faith in our changing world, what he calls in his 2002 book of the same name *Evolutionary Faith*. In his work *Quantum Theology: Spiritual implications of the New Physics* (revised edition, 2004) he holds that quantum

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<sup>6</sup> While he predates such interpretations within quantum mysticism, Pierre Teilhard de Chardin shared this concept of love in his evolutionary account of the universe in the 1950s.

mechanics invites everyone to set aside their predispositions and outlived religious confines to embrace the image of the whole emerging from quantum science.

O'Murchu holds that the invitation our quantum world has extended to us is one of a participatory journey to understanding. O'Murchu believes that this merging of cosmology with theology is an invitation to engage in a new theological discourse. It is one that he suggests draws from aspects of many theological approaches, such as Liberation Theology and its struggle for freedom from oppression and Feminist Theology, in its respect for experience and holism. As well as main features of the Theology of Multifaith Dialogue, which speaks to each faith's ability to lead us to God. As it would not be based on religion, it would be another theological horizon.

O'Murchu presses the idea that religious narratives are but particularizations of a greater universal narrative of meaning. In closing, he draws from McFague's contemporary theology of love (McFague, 1987; 1993; 2001 in O'Murchu, p. 200), which calls for new metaphors for God in the face of quantum holism. This quantum theology sees the universe as the divine self-expression of God, of which we are a part. It claims that love, in all its forms, agape, eros, philia, is an inter-relational energetic phenomenon; and that harnessing the power of love, the interdependent life-force, would be the greatest quantum leap of faith we could hope to take.

The mystery and meaning that some see as innate in quantum theory have far reaching metaphorical, philosophical and mystical implications, raising some spiritually provocative issues. He too argues for a holistic quantum view of the universe, like Goswami and Laszlo. He suggests, drawing from Fritjov Capra, that the universe is a dynamic whole, a cosmic dance continuously vibrating and moving. Rather than

determinism in nature, O'Murchu sees nature, in light of the quantum, as characterized by possibilities. This, O'Murchu states, invites us to outgrow limited horizons in both science and religion.

With these insights into the main concepts within quantum science and the mystical interpretations, the direction of this paper becomes clearer. The idea of the transcendent unity underlying our reality parallels the metaphysics of the divine within many religious traditions. These interpretations call for a new perspective in how we describe, understand and relate to our world. The next chapter will describe the open, multivalued methodological approach I will apply to investigating the quantum God-concept.

## CHAPTER 2—METHODOLOGY

As the lay public, including myself, does not, and certainly most cannot, decipher the deep nuances of the mechanics behind the quantum, let alone the physics itself, they depend on media sources such as print literature and electronic media like the Internet and film. The way the quantum world is presented is imperative to how we understand quantum mysticism and the idea of the quantum God. It will also inform the methodological approach I will take in this paper. The incorporation of multiple interpretive theories and the *mélange* of metaphorical explanations used to portray this world of intriguingly microscopic scales and its mystical implications demands a different kind of reasoning than has become characteristic of the modern world. Just as the physical laws of the macroscopic Newtonian world don't apply in the quantum world, binary logic is not well suited for understanding the quantum world as it is presented to date. As binary logic assumes only A or not A can be true at any one time, it does not account for the uncertain terms of the quantum.

Since the science suggests that the processes of our universe are fundamentally probabilistic and non-empirical at the quantum level, there is only so much that can be described in traditional scientific terms. Science then finds itself challenged to expand its use of resources to include language and ways of thinking not traditionally employed by scientists. According to the sources used in this thesis, considerations beyond the physical become imperative. Metaphors become necessary to clarify the implications of the mathematics involved. These metaphors invite the philosophical concerns of cosmology, ontology, epistemology and other affairs of natural philosophy and metaphysics. This is

where theology comes into play, through metaphors and metaphysics.

The indispensable metaphors and metaphysics that the quantum world forces us to rely upon in order to understand its strangeness are all supported by the same science and provide identical predictive ability and, in these terms are therefore equally valid. Taken together, they build an analogical image of the quantum God. This is the way such concepts tend to be presented to the general public as they learn more about the quantum realm; the theories are usually presented together and their interpretations combined to form a broader understanding of what the quantum may be like. I will use what is known as multivalued logic to account for this. With it, I will equally consider not only the scientific and theological considerations of the quantum, but also the multiple interpretations within these understandings in order to draw a more unified image of God from some of the analogies used within quantum mysticism. The methodology of this investigation is then one of multivaluing multiple sets of metaphors and metaphysics.

The conceptual trickiness of the quantum forces scientists out of their area of expertise, calling for a re-evaluation of the approaches used to make sense of the world and the reintegration of varied specialties and schools of thought into a new dynamic multivalued exploration of our universe. The aim of this paper is to articulate mystical images from research into the quantum as it arises from the various interpretations and then to illustrate how these images coagulate into an image of God and how they are appropriated in one particular case, that of the Christian God. With this in mind, this chapter will explain the importance and necessity of metaphor and metaphysical considerations in understanding the mystical qualities of quantum science and the multivalued approach it calls for.

### Multivalued Logic

In their 1997 article, *From Quantum theory to Quantum theology: A leap of faith*, M. M. J. Basson and J. H. Koekemoer argue that an epistemological shift in theology is called for by the challenges of modern culture, interreligious exposure, and scientific discoveries. They introduce multivalued logic as an epistemic model “specifically developed to accommodate diversity, uncertainty and probability” (p. 276) in an “honest attempt to carry theology over the threshold of the twentieth century” (p. 285).

Multivalued Logic was specifically developed to deal with quantum mechanics, more specifically Heisenberg’s uncertainty principle, in the 1930’s by logicians, such as Jan Lukasiewicz, Bertrand Russell and Max Black. Also known as Multivalent Logic, Multivalued Logic is defined by its fluidity and its ability to hold more than one truth at a time. It is based on the assumption that most human reasoning is approximate in nature; there is a continuum between truth and falsity and everything has elements of both.

By 1965 the idea had been worked into what Lofti Zadeh termed Fuzzy Logic. In a world of approximates, according to Basson and Koekemoer, all properties can be considered what are called fuzzy sets.

Fuzzy sets don’t draw hard boundary lines, but draw curves between A’s and not-A’s. ... Where the hard lines of bivalent logic are unable to explain the shift [from A to not-A], the fuzzy curve shows the smooth change, thus exploring possibilities of coming closer to reality (1997, p. 281).

Fuzzy sets give linguistics math as well, like calculus, the mathematical study of change; using modifiers can raise or lower a curve allowing room for more accurate interpretation

and understanding. This conceptual openness is also reflected in the use of metaphor, a tool Basson and Koekemoer describe as an indispensable tool in the “shaping of rationality in science and religion” (p. 286). Metaphors can be seen as fuzzy sets, providing a smoother curve on the path to truth. Unlike logical propositions, metaphor is open to a wide range of connotations; it has an elasticity. Frieda Stahl quotes Jeremy Campbell’s definition of metaphor as follows:

Metaphors are devices which make connections between things which have no obvious relation to one another ... Metaphors synthesize disparate ideas. They allude, match, compare. They include and integrate possibilities (Stahl, 1987, p. 58).

Basson and Koekemoer hold that the expanded rationality of the quantum world recognizes that language cannot be precise and calls for a positive re-evaluation of metaphor, myth and analogy, which are vital in the creation of both scientific and theological theory. Metaphor and analogy can sometimes be the best way to describe a phenomenon, especially in quantum science where everything is so abstract and uncertain. The metaphorical nature of quantum theories and their mystical connotations are thus a main aspect of the theistic interpretations of the science.

Basson and Koekemoer are quoted as saying, “when fuzzy set theory is applied to theological terms, it opens an infinite spectrum of options, thus broadening the rationality behind our understanding of theology” (1997, p. 280-281). A quantum theology would then be a multivalued theology in all respects, from the regard for metaphor to the incorporation of diverse perspectives. This is the premise on which I will investigate the image of God from quantum science; I use a multivalued approach

to discern the dimensions of the God-concept that emerges from the interpretations of the science mentioned in the previous chapter. Accordingly, images of God that emerge from interpretations of quantum mysticism will be valued in themselves even if they are not entirely consistent with each other under logical, linear reasoning. Before I do this I will further explore the importance of metaphor and metaphysics in this process.

### Multivaluing Metaphorical Metaphysics

While it is the case that quantum science seems to invite a broader use of metaphorical language, both science and religion have been known to use metaphor traditionally. According to Earl R. MacCormac (1971) “Historical studies of scientific terminology have shown that terms like force and mass have never been precisely defined and that they have operated as metaphors” (p. 239). Rebecca S. Oshlag and Hugh G. Patrie (1993) argue that it is not just a heuristic claim, but also an epistemic claim that something very much like metaphor makes acquisition of new knowledge possible. George Lakoff and Mark Johnson clarify, in their 2002 book *Metaphors We Live By*, that metaphors are the basic structure of our understanding, by using what we know to interpret an infinite number of new things.

Metaphors are mappings across conceptual domains. ...

Mappings are not arbitrary, but grounded in the body and in everyday experiences and knowledge. ... Our metaphor system is central to our understanding of experiences and the way we act on that understanding (Lakoff, 1993, p. 245).

MacCormac (1975) quotes E. H. Hutton as saying, “metaphors are used to give a more precise meaning, or to add an important *nuance*, to [physicists’] expressions... In

physics [they] speak of *field* force, or the *flow* of heat, and so on. Indeed, technical discourse cannot do without metaphorical language” (p. 403). For example, wave-particle duality is only called such because there is no other existing pretense to describe the phenomenon. Stahl, in her article *Physics as Metaphor and Vice Versa* (1987), notes how Arthur Eddington suggested the neologism ‘wavicle’ in his 1927 Clifford Lectures in an attempt to distinguish the phenomenon as its own idea (p. 59). Entanglement, uncertainty and the collapse of the wave-function are all metaphorical concepts used to best approximate the nature of the scientific findings.

Language and personal reference points are essential when providing explanations for a physics that is so confined to the realm of mathematics. Metaphorical, lyrical, poetic language is then quite often needed to allow for expansion and better understanding. It is also, in essence, how we create our world; how we perceive the world around us impacts how we explain it and vice versa. In considering the quantum level of the universe, as presented above, our perception, our observations are collapsing potentiality into reality, not only necessitating metaphor for its understanding, but embodying the very essence of metaphor, as we use our consciousness to create new considerations, new horizons, new realities. In this section I will cover how the use of metaphor fractals in its application not only to how the quantum world and our entire universe is interpreted but also how it functions. Fractals are infinite patterns that display self-similarity at every scale. As the latter half of this paper will show, the implications of quantum theories are summed up perfectly in this concept.

As we try to make sense of the world around us, metaphor becomes indispensable. All of us thinkers, poets and metaphysicists, whether we are doing science or philosophy,

or anything else for that matter, find ourselves relying on metaphor. Language, as a system of symbols, is approximate. Metaphors intentionally intensify this ambiguity. In his article *Expression and Metaphor* (1963), James M. Edie explains:

Language is intrinsically referential in that it bears an intrinsic reference to its source, the intentional act of consciousness which is its correlate, man as expressive. ...Heidegger has said that it is the function of the thinker and the poet to 'name' new things, new aspects of experience, and thus to bring what was 'unknown' and as yet hidden or lost in the chaotic flux of experience out into the open, into the realm of the 'known'- into the public domain (p. 541).

When scientists use this capacity of metaphor, poetic expressions of rational concepts are created, which allow for closer approximations to truths.

According to Edward W. Strong in his 1937 article *Metaphors and Metaphysics* "a metaphysics is regarded as an ultimate and comprehensive explanation of nature and man" (p. 463). As seen in the previous chapter, the idea of quantum holism from metaphorical interpretations of quantum mysticism naturally crosses into the realm of metaphysics, speaking to ultimate images of all things. Quantum physicists then act as metaphysicists, philosophers of life and ultimate existence. Although sometimes speaking outside their area of expertise, they however find themselves supported by a multivalued rational system, into which they add their poetically expanded perspectives, broadening our overall knowledge base of what our universe and our place in it ultimately may be.

Strong argues that the inclusion of metaphor and analogy into metaphysics is imperative to avoiding static concepts and writes in favor of what he calls an analogical metaphysics.

The source of analogical metaphysics is metaphor and myth; the power of the myth is evocative and not demonstrative; and the truth of metaphor in metaphysics is poetic truth—enhanced, vivified, and perpetuated meanings. . . . Where rational means fail, the philosopher has recourse to poetry. The poetry is intellectual poetry sprung from metaphor and expressed as analogical metaphysics (1937, p. 462).

The quantum metaphysics is backed by sound mathematics, which are then enlightened and made more understandable through the use of metaphor. Strong (1937) hails what he calls the genius of metaphysicians “to conceive cosmic metaphors whose expression [he has] called intellectual poetry” (p. 463).

The gaudiness and ambiguity of the poetic dress of ideas are inept for critical work. Analogical metaphysics, however, is a work of construction by likeness and images. To reason *by* likeness is analogical method. To reason *from* likeness, where likeness is a cosmic metaphor, is analogical metaphysics. Poetic optimization in the figure of metaphor, ideal participation in the prefiguring myth, and dogmatic conversion in the theology that transfigures the metaphor are the three stages by which poetry passes into metaphysics. (Strong, 1937, p. 463).

Though it may sound anti-pragmatic from a modern empirical perspective, the literal acceptance of metaphor, as Strong proposes, is something we do everyday with our basic beliefs. Strong sees the literal acceptance of metaphor as the way in which metaphysics and theology grows. He writes:

To accept this cosmic metaphor literally... is to convert it into an explanation of the "how," "what," and "why" of all things that can be, or can be conceived to be. Without the conversion, the metaphysical construction would be a comprehensive mythology asking only for sympathetic participation. With the conversion, the lover of wisdom is wedded to dogma. Beatrice [from Dante's *Divine Comedy*] prefigured by love into a star is an ultimate idealization; but Beatrice transfigured in a real paradise is Beatrice as theology (p. 465).

Stahl holds that “because physics is so structured, poetry is its manifest parallel in literature” (1987, p. 61); the fuzzy sets of the intellectual poetry within quantum metaphysics could be considered a real world expression of the paralleling concept of the probabilistic non-empirical realm of the quantum world. Jan Zwicky (2006) holds that “lyric’s intuition is that the grammars of consequence—of narrative and argument—distort the mystery of what is: the order of the world... is not rational, casual or systematic. It is rather resonant. The world’s resonance is its integrity” (p. 95). Echoing the essence of the multivalued quantum perspective, Zwicky describes the validity of analogical metaphysics and its use to best describe our world<sup>7</sup>. Strong also writes,

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<sup>7</sup> See more on lyric in Zwicky, J. (2006). Lyric, narrative, memory. In *A Ragged Pen: Essays on Poetry & Memory*. Gasperaeu Press; 93-100.

The basic conviction of the philosopher now buttresses essence with capital letters and speaks of Truth, Reality, Being, and First Principles. A metaphysics conceived in poetry is now termed the science of sciences (1937, p. 462).

As most other metaphysical theories, the quantum metaphysics and quantum theology that are growing from such interpretations of the science are grounded in metaphor, along with most of our experiences and understandings. As I briefly covered in the previous chapter and will discuss in detail in the next, the nature of the interpretations within quantum mysticism are hinged on consciousness and experience, more specifically the ability of consciousness to create and inform experience and vice versa. Experience and perception are central to how the world works, even more so within a quantum framework. The observer is always integral to the data. Stahl (1987) quotes Jacob Bronowski as saying,

We remake nature by the act of discovery, in the poem or in the theorem. And the great poem and the deep theorem are new to every reader, and yet are his own experiences, because he himself re-creates them (p. 61).

Experience can only be expressed in poetic lyrical terms and in turn that expression is then re-experienced by the receiver, interpreted, transformed and re-expressed as the cycle continues.

To Strong the distrust of the poetic essence of philosophy and theory is misanthropic, as it is an essential partner of physics and mathematics.

It limits language ... to abstract and formal terminology, affirms the scalpel and denies the brush. One can dissect but not evoke and depict with the apparatus of logic. ... The very language by which [the clarification of concepts] is conducted imports a metaphor. To clarify is to shed light—to cast illumination; to conceive is a function of bringing to birth. ... Unless we have some intellectual light and vision, we are chained to the dungeon of contiguous circumstances (1937, p. 467).

Multivalued logic, however, tells us that poetry is not the whole truth, even though it may be the closest linguistic caricature for physics; “metaphorical understanding is grounded in nonmetaphorical understanding” (Lakoff, 1993, p. 245). Metaphors can generate insight and they can also distort. They have both strengths and limitations. Gareth Morgan (1997) explains there can be no single or simple theory or metaphor that provides the prime vantage, the challenge is not to find one, but to find ever new ways of seeing, understanding and shaping actions. This again parallels the multivalued perspective that I will show in this paper is central to quantum metaphysics.

Of course, there are many critiques to such approaches in the rational modern West, which is so attached to prosaic narrative and absolutes. Klein (2002) notes the difficulties for scientists in dealing with the “murky” philosophical implications and their fear of having the science be misused in light of so many lyrical interpretations, as some have accused the film *What The Bleep Do We Know?!* (2004). However, theologians have always dwelt in such a realm and, as Klein holds, having both disciplines in similar territory may be for the best as our understandings of the universe stand on such uncertain

ground. Klein also notes that detractors claim the metaphorical interpretations of quantum physics, more precisely the moveable observer-observed split, imply an unstable shifting ontology, which is unacceptable to most. His response to this is that the fundamental nature of the universe seems to be far stranger than our current paradigm allows for.

One must remember the historical origins of physics, metaphysics, theology and literature, which were all once known as natural philosophy, the comprehensive exploration of the cosmos, and how they still function as such today (Stahl, 1987). This multivalued standpoint also reflects the idealist quantum sentiment; the physical and metaphysical explorations of the quantum are to be given equal consideration in our attempts to understand our world. For matter and mind, and all things for that matter, are anything but mutually exclusive from the idealist perspective of quantum mysticism. This is how some now present quantum discoveries and how I will best describe the holistic quantum God-concept.

To recap, Multivalued Logic is a logistical system specifically created to deal with the uncertain nature of the quantum, to work with multiple probabilities and truths at one time. The theories covered in chapter one all explain different perspectives and probabilities of the nature of the quantum world. As it can be seen that their equally probable metaphorical descriptions do not discount each another, but compellingly embellish one another, the picture of the quantum God is then a mosaic of these findings. As such, it requires an amalgamation of interpretations to best describe and comprehend. This is how the sources within quantum mysticism tend to present the quantum world, piecing together the scattered and awe-inspiring information of the fundamental workings of our universe. Thus they paint the picture of what such an otherworldly scene may be

like, as I aim to do in describing a new understanding of God based on certain interpretations of the quantum.

The quantum theology defining and exploring the image of God, emerging from interpretations of quantum physics and its far-reaching implications, is in essence a multivalued theology. It is an interdisciplinary exploration of God and the universe, multivaluing many different metaphysical claims. My multivalued methodological approach will consider the main conclusions of the theories covered in the previous chapter and deal with the implied veiled transcendent reality, as presented by Ward's main concepts of interconnectedness, indeterminacy and idealism. The next chapter will use these three concepts to describe the images of God that emerge from the literature discussing quantum metaphysics and theology.

## CHAPTER 3—THE IMAGE OF GOD FROM QUANTUM SCIENCE

As discussed in chapter two, the metaphysics used in the interpretations within quantum mysticism have extended into theology; this is where the idea of the quantum God emerges. As I outlined in chapter one, the hidden reality of potentiality also referred to as the non-empirical or veiled reality (Schäfer, 1997; 2006; 2008) underlying our material realm could be considered a consciousness field from which all things arise. Ward's three main concepts of indeterminacy, interconnectedness, and idealism describe the transcendent conscious whole that is presented by the sources writing on the images of God from quantum science.

The main concepts within quantum mysticism have developed into a metaphysical theory of an ultimate all-encompassing field, or vibrating sea of intelligence or informed consciousness. This consciousness field is thought to be an observer observing itself from an infinite perspective. It is ever experiencing, interpreting, creating and transforming, through us and all other things; an idea that is analogous to many concepts of God. This is leading to the proposal of a new scientifically based God-concept, where God is not only the creator of the universe, but also encompasses all of reality. A cosmic being that consists of, as well as creates, maintains, and transforms through consciousness.

This chapter will thus present a multivalued overview of the image of God presented by the interpretations from chapter one and the scientific metaphors used to describe quantum reality. First, the quantum field mentioned earlier will be discussed; secondly, the conscious nature of that field, and finally, how this consciousness field has come to be referred to as the quantum God.

### The Great Field

Finding a Unified Theory of Everything has been the driving force for many physicists in the past two centuries and was a known ambition of Einstein's. Laszlo notes that Einstein himself conceived of a Unified Field theory, as he considered all phenomena in physics as "the interaction of continuous fields" (2007, p. 23). While it was not well received, it harkened back to work on Michael Faraday's electromagnetic field and contributed to the popularity of field theories thereafter. Laszlo elaborates:

James Clerk Maxwell proposed that [Faraday's] electromagnetic field is not local but universal: it is present everywhere. ... The universal electromagnetic field was a revolutionary insight, for it meant abandoning the notion of empty space as a mere vehicle for conveying the forces involved in the interaction of particles. Space was henceforth conceived as a continuous universal field... As theories grow and develop, the explanatory concepts tend to become more generalized. In this way, what were initially seen as local force fields are later understood as universal fields, present at all points in space and time (Laszlo, 2007, p. 88-89).

This leads us to the issue of coherence. Coherence is the idea that processes and rhythms remain constant and harmonized, originally referring to the phase relations of light (Laszlo, 2007). It has been shown that the universe is extraordinarily coherent, or fine-tuned, as science expands its exploration of our universe in an increasingly sophisticated way. This coherence penetrates to the depths of quantum explorations; as

the quantum is presently understood, it is ubiquitous. Findings of experiments done by the famous trio of Einstein, Podolski, and Rosen dealing with entanglement suggest remarkable coherence at the very fundamental levels of our physical reality (Laszlo, 2007). This is referred to as nonlocal coherence. This has led Laszlo and others to the belief that a universal quantum field enables and maintains this coherence. So, what then is this field and how is it currently understood within quantum mysticism?

Discussion of the quantum field utilizes the interconnectedness and indeterminacy concepts described by Ward and the idea of the veiled-reality, covered in the first chapter. The idea of the quantum whole discussed thus far is supported by decades of rigorous scientific exploration into the subatomic world. O'Murchu (2004) writes that support of such a notion began to coalesce in the first half of the twentieth century, with the idea of the holon, where the whole is perceived as greater than the sum of its parts, and the hologram, in which the whole is also contained in each part. David Bohm's experiments with plasma, a "high density of electrons and positive ions" (O'Murchu, 2004, p.62), found that in such a state, electrons begin to act as though part of a greater interconnected whole. Their collective movements are known as plasmions. This, along with the implied presentness of the whole in each of the parts, what we know now as nonlocality, led Bohm to believe that it was a whole rather than the parts that comprises the basic structure of reality, an "unbroken wholeness, or implicate order" (p. 62).

Another of Bohm's breakthrough concepts, quantum potential, covered in chapter one in its present understanding as potentiality, leads us to the idea of what O'Murchu calls "our holographic universe" (p.61). This connects with the veiled reality of potentiality mentioned earlier, which consists of virtual states. These virtual states are

“operative not in isolation but in relationship with associate particles and in cooperation with the environment” (p.63). This cooperation suggests an implicate coherence, like Bohm’s implicate order (O’Murchu, 2004). According to Laszlo, the space and time transcending phenomena of nonlocal coherence are found in many diverse fields, such as “physics, cosmology, evolutionary biology, and consciousness research” (2007, p. 74). For example, biological field theory attempts to account for quasi-instant correlations within living organisms (Laszlo, 2003). Whatever enables such coherence seems to be universal, as it functions on the micro and macro levels.

What does this coherence imply then? Well, coherence implies organization and organization implies information. As Laszlo writes,

Identifying this connecting element could solve the puzzles at the forefront of scientific research and point toward a more fertile paradigm. We can take the first step toward this goal by affirming that information is present, and has a decisive role, in all principal domains of nature. Of course, the information that is present in nature is not the everyday form of information but a special kind: it is “in-formation” –the active, physically effective variety that “forms” the recipient, whether it is a quantum, a galaxy or a human being (2007, p. 74-75).

The idea of in-formation<sup>8</sup> in nature is a crucial scientific metaphor according to Laszlo, providing the foundation for many theories of everything. The evidence of patterns and

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<sup>8</sup> “[In-formation] is neither knowledge received about some fact or event, nor a pattern imposed on a transmission channel, nor yet the reduction of uncertainty regarding multiple choices. Information—in the sense of knowledge about things and events—may be conveyed by in-formation, but in-formation itself is different from information in the usual definitions. ... In-formation is a subtle, quasi-instant, non-evanescent

organization in the universe and its ubiquity lend more credence to the idea of a holographic fabric underlying our material reality, containing and consisting of infinite in-formed potential.

Schäfer writes that Bohm emphasised the whole was process, quoting Bohm's description of reality as an "Undivided Wholeness [that] is Flowing Movement" (2008, p. 342). In accordance, O'Murchu uses dance as a scientific metaphor, as he perceives the ultimate landscape as follows:

... [N]ot a landscape of facts or objects, but one of events, of processes, movements, and energy. In this creative flow, past, present and future are indistinguishable. Every creation of matter, influenced as it is by consciousness, is a recapitulation of all past creation and carries an inherent propensity to become something more than it is at any present moment. For this continuous, creative movement, Bohm coined the term "holomovement".

Everything in the cosmos is made out of the seamless holographic fabric of the implicate order (2004, p.63).

This holism is reflected in Unified Field Theories (Hagelin, 2011).

The Grand Unified Theories, developed in the last half of the twentieth century, held that "the roots of all of nature's fields and forces are traced to the unified vacuum" (Laszlo, 2007, p.76), the void beyond the quantum. The idea of the vacuum in physics was originally held as nothingness, impotent empty space. The understanding of the unified vacuum evolved with subsequent observation and experimentation, however, into

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and non-energetic connection between things at different locations in space and events at different points in time. Such connections are termed 'nonlocal' in the natural sciences and 'transpersonal' in consciousness research." (Laszlo, 2007, p.82)

what is now described as a “physically real medium that interacts with matter and produces physically real effects” (p. 76). John Hagelin writes,

Quantum Field theory thereby presents a rather simple and profound view of nature in which the previously unrelated concepts of particle and force are naturally unified within a single theoretical construct: “particle” and “force” simply correspond to different modes of activity of an underlying quantum field (Hagelin, 2011, p. 37).

It could then be possible to surmise that this field is responsible for the coherence observed in all scales of nature (Laszlo, 2007).

This leads back to the same conclusion; all phenomena are varied manifestations of a single thing: ceaseless, interconnected, structured, effective potentiality. There is an in-formed connective force beyond particles, beyond empty space, beyond our physical reality, yet inexorably intertwined with them all: the Great Field (James, 2007). In the words of O’Murchu:

Despite the apparent separateness of things at the explicate level, everything is a seamless extension of everything else, and ultimately the implicate and explicate orders blend into each other. An electron is not just an elementary particle; it is a name given to a certain aspect of the holomovement, one of the several dancers in the great cosmic sequence of movement and pattern (O’Murchu, 2004, p. 63-64).

As explained in chapter two, the idea of fields of force and energy function as scientific metaphors and, the great field functions in the same way. The unified field is the veiled virtual reality of potentiality, what O’Murchu refers to as a dance of energy and what Laszlo deems the oceanic plenum, the “invisible enfolded realm of potential and possibility” (O’Murchu, 2004, p. 63). Whatever title it holds, the unified field remains inaccessible to the human senses, beyond observation by any sophisticated technical aids but mathematics and imagery. It can be imagined in myriad ways, take on manifold forms, and the implications are still the same, as the varied interpretations within quantum science have shown.

It is nonetheless clear that this field exists, for it produces real effects...so we must accept that a universal in-formation field conveys the effect we described as nonlocal coherence throughout the many domains of nature (Laszlo, 2007, p. 89).

Therefore the fabric of reality, the implicate order described by the quantum, can be visualized as a grand universal field of in-formed holomovement, according to a mutualvaluing of the sources used in this investigation.

As noted in chapter one, Laszlo likens this idea to the philosophies of ancient India. In Sanskrit cultures the cosmos is comprised of two basic materials, one being a numinous substance known as Akasha (Laszlo, 2007). He describes Akasha as follows.

Akasha is an all-encompassing medium that underlies all things and becomes all things. It is real, but so subtle that it cannot be perceived until it becomes the many things that populate the manifest world. ... [According to the great Indian Yogi, Swami

Vivekananda] At the beginning of creation there is only Akasha. At the end of the cycle the solid, the liquids, and the gases all melt into Akasha again, and the next creation similarly proceeds out of this Akasha... (Laszlo, 2007, p. 89-90).

This vision parallels the Metaverse, or Multiple Universe Theory from chapter one, but also includes proponents of all the theories within quantum mysticism I have noted.

Although this field goes by many names and is described by an array of imagery, many working in quantum science work mainly with secular, materialistic explanations. Others, however, are maintaining that this field may be a scientific description of an ultimate transcendent mind-like, or God-like concept. Ward says,

It is a natural, though not forced, step from here to make the move that Augustine made in the fifth century CE, and set this veiled reality within the mind of God (Ward, 2005).

Before examining how the word God relates to the field the word mind must be explored. How is it that this transcendent field is understood by some to be a mind-like structure?

### The Conscious Universe

The coherent informed nature of the universe as described by quantum science, is thought by some to display similar features to those of a living organism. The informed transcendent nature ascribed to the quantum whole suggests an inherent intelligence within and parallel to the holon that is the mind, enigmatically greater than the sum of its parts. The pivotal and poignant role of consciousness in the creation and maintenance of our physical reality, along with the supposed unified foundation to all physical

phenomena, make it plausible to conclude that the two may be the basic elements of this one source, the Great Field.

The quantum phenomena make it possible to think that the nature of the One is that of a Cosmic Consciousness (Schäfer & Roy, 2008, p. 8).

As seen thus far, based on General Relativity and subsequent findings, the universe could be considered a single substance. This brings us to the most important of Ward's main concepts: Idealism. The scientific notion that all might be one, and that such oneness may be consciousness is Goswami's monistic idealism. This is encapsulated in what has been referred to as esoteric science. An esoteric approach to science involves "exploring the fabric of reality through *clairvoyant means*" (Jackson, 2002, p.1), through inner knowledge, through consciousness. It is the metaphysical conceptual approach that many have claimed is called for by the strangeness of the quantum, which extends beyond the science and into the mystical metaphorical.

As discussed above, the Great Field could be visualized as an informed holographic matrix of potentiality. Jackson (2002), clarifies:

The hologram is of course a static recording and is only a *metaphor* for a new notion of order. It illustrates however that there are notions of order that behave in a very different fashion from the linear order that we are used to [relying] on... (p. 5).

General Relativity theory as it is presently understood, however, has always been at odds with quantum mechanics, each taking their place as the two central pillars of physics in the early twentieth century (Jackson, 2002). "The problem is that the theories are

incompatible in their very nature since the theory of relativity assumes reality to be continuous, deterministic and local, while quantum mechanics are nonlocal, discontinuous and indeterministic” (Jackson, 2002, p. 1). The esoteric idea of a conscious universe, however, not only remedies many such paradoxes, but also fits the science in such a way that many are convinced is obvious in light of observations of the quantum. How then is the Field thought to be conscious and how is this consciousness understood as a self-aware mind-like entity?

Since it can be said that in a holistic order everything contains the all, that “every part of the hologram corresponds to every point in the picture” (Jackson, 2002, p. 5), it is then logical to posit that if consciousness is present in certain observable points of our holographic universe, then it may be present in all other parts in other varying forms. This accounts for the observer issue mentioned in chapter one. The wave-function collapse depends upon consciousness and consciousness as we define it exists only on our tiny planet as far as we know. The idealist notion that the conscious whole enables the collapse beyond the scope of humans is a satisfying explanation in light of the figurative quantum queasiness that comes from dealing with such explorations of reality. This idea is referred to as panpsychism.

This idea of panpsychism, the idea that everything in the universe is conscious, may be hard to prove, but if we truly look at human consciousness, we see that we only ever truly know our own minds, for consciousness is a private phenomenon (Laszlo, 2007). We look for similarities in other things to indicate their consciousness.

What we call “matter “ is the aspect we apprehend when we look at a person, a plant, or a molecule *from the outside*; “mind”

is the aspect we obtain when we look at the same thing *from the inside*. (Laszlo, 2007, p. 125).

This idealism implies that mind has existed always as an aspect of all things, on the inside (Denker, 2010). Denker refers to Edgar Mitchell's similar view and writes:

[As Apollo astronaut Edgar Mitchell essentially put forward] All things in the world, he said, have a capacity to “know”. Less evolved forms of matter, such as molecules, exhibit more rudimentary forms of knowing—they “know” to combine into cells. Cells “know” to reproduce and fight off harmful intruders; plants “know” to turn towards the Sun, birds to fly south for the winter. The higher forms of knowing, such as human awareness and intention, have their roots in the cosmos; they were there in potential at the birth of the universe. ... All things in the world—quanta and galaxies, molecules, cells and organisms—have “materiality” as well as “interiority”. Matter and mind are not separate distinct realities; they are complementary aspects of the reality of the cosmos (p. 126).

According to the new quantum cosmology, mind and matter are complementary and inseparable in our material universe.

Subatomic particles seem to act with some sort of agency, an ability to randomly act on their own to further a purpose (Denker, 2010).

The creation of quantum particles is random, as stated by Heisenberg's... Uncertainty Principle. The creation of quantum

particles shows purpose because of the particle's role in the evolution of the universe in a designed way in which intelligent life was formed... What then is the source of agency? Well, it is at least the human mind (Denker, 2010, p.134).

As quantum phenomena show real connections to human consciousness, it can be extrapolated that consciousness may indeed be a characteristic of the Great Field and that this field may be a type of Great Mind.

Consciousness research, a field of study known as noetics, has been largely impelled by esoteric theories. The enigmatic nature of consciousness has long perplexed and fascinated humans. Most living things have some kind of consciousness ascribed to them, as mysterious and subjective as it may be. Observations of what have been understood as inanimate matter and processes in nature, however, provide evidence for the theory that the universe acts as a living organism would (Denker, 2010). Seemingly static linear processes apparently have the ability to change randomly, as nonlocality shows an underlying coherent unpredictability; Denker refers to this as inspiration.

Non-living systems are known to display only predictability (Denker, 2010), but the quantum flies in the face of this fact. Denker points out that design can have a random origin, but randomness cannot have a designed, complex origin; true non-intelligence cannot have an intelligent source or it would hold within it evidence of said intelligence. This is a logic that some say is implied in quantum idealism.

This is the irrationality of Newtonian physics. It has tried to explain the origins of human intelligence through the functioning of non-intelligent inanimate particles in the brain,

but this simply cannot be the case. Human consciousness has to have an intelligent semi-chaotic origin (Denker, 2010, p. 255).

Thus, consciousness begets consciousness and if it is ascribed to living beings, then it can logically be extended to the quantum whole: a living field of cosmic consciousness.

This understanding of the conscious universe encompasses aspects from all the theories covered in chapter one, in light of evidence supporting the ideas of the non-empirical realm, the primacy of consciousness, and nonlocal coherence.

The [universal consciousness in line with the Copenhagen Interpretation] is coherent but de-coheres to form the object –the physical universe just as the human mind creates its brain from itself. Through the action of percolation caused by a state of criticality the brain mimics the universe constantly de-cohering and cohering. Maybe our world is just a thought in God’s mind. This hypothesis is in line with Georg Hegel’s absolute flowing in and out of incarnation. It is the unpredictable invisible becoming predictable visible becoming the unpredictable invisible again, and on and on. It is this quantum non-locality that has caused scientists, such as Kaftos and Nadeau, ... Roger Penrose, ... and Alfred North Whitehead ... to declare that the universe is not only alive but conscious (Denker, 2010, p. 143-144).

Thus, according to quantum Mysticim, the Great Field may indeed be intelligent (Denker, 2010), conscious (Goswami, 1995(1); 1995; Jackson, 2002; Klein, 2002; 2006; James, 2007; Laszlo, 2008; 2010; Schäfer, 1997; 2006; 2008), and self-aware (Goswami, 1995).

At the fundamental level of the quantum whole, this super-informed, transcendent mind-like, organism-like structure could then be considered an entity.

If the universe grows and evolves and acts in the same manner as a living organism and indeed, can change its own path of evolution, it is a living organism. If it looks like a duck and quacks like a duck, it's a duck (Denker, 2010, p. 294).

This extends panpsychism to what could be called panenpsychism, and thus panentheism, the idea that not only is God the universe, but God extends infinitely beyond it, in light of the non-empirical veiled reality existing beyond our world. This reasoning by likeness is, as discussed in chapter two, analogical method; and as Strong said, to do so where such likeness is a cosmic metaphor, is analogical metaphysics. The “literal” (Strong, 1937) acceptance of the cosmic scientific metaphors of the oceanic plenum, the cosmic dance, the Great Field, and the metaphor of its conscious nature is where quantum metaphysics enters the realm of theology and, thus, gives rise to the analogy of God.

### The Quantum God

As Ervin Laszlo states: “The universe is far more complex and coherent than anyone other than poets and mystics have dared to imagine” (2007, p. 49). This quote summarizes the basis on which quantum science gave rise to quantum mysticism and it is startling how close the interpretations within quantum mysticism are with established images of God. These will be discussed further in the next chapter. It may be acceptable to think that there is a field of potentiality beyond our physical world. It may even be understandable that this field is made up of some sort of information, even intelligence,

but, how is it that this field can be understood as God? Why use the word God? Ervin Laszlo cites Deepak Chopra as saying:

In religious traditions [one's] core consciousness is referred to as a soul which is part of a collective soul or collective consciousness, which in turn is part of a more universal domain of consciousness referred to in religions as God (2010).

God, however, is understood in many different ways. Not only as the foundation of our world, but as a sovereign being. As indicated in the above discussion of the functional similarities the Great Field shares with living organisms, some claim the quantum is animating our universe. Stephen Barr expands on this:

A probability is a measure of someone's state of knowledge or lack of it. Since Quantum Theory is probabilistic, it makes essential reference to someone's state of knowledge. That someone is traditionally called the observer. As Peierls explained, 'The Quantum mechanical description is in terms of knowledge, and knowledge requires *somebody* who knows' (2007, p. 23-24).

The consciousness field from which all things arise is believed to function as an observer, analogous to how we function as observers; it is a macro-representation of our consciousness, a fractal of ourselves, as we are fractals of it. Denker observes:

In science speak the object of observation is the physical universe and the observer a mystical God—a consciousness that transcends both humans and nature. Scientists don't like to sound religious,

so they say ‘observer’ rather than ‘god’ because it has more of a psychological scientific flavour (2010, p. 16).

As, according to Denker, Laszlo and many others, the enigmatic nature of reality presents itself as a self-creating, self-organizing, self-renewing and self-maintaining, structure. It would then be no stretch of the imagination to apply the word self to the consciousness which constitutes the Great Field. It can be considered the ultimate source of being and knowing; Denker’s “ontic all” (2010, p.168).

This great Self can be understood as “a natural force that one can call the mind of God” (Denker, 2010, p.98). This metaphor of the mind of God, the ultimate self, is contained within another analogical concept: love. Love, understood by Denker, as oneness, and by O’Murchu as the inter-relational interdependent life-force, is the ultimate essence that binds and unifies, enabling the consciousness of the God-self. This is an understanding of love at its fuzzy edge. According to Denker, if consciousness is the primary principle of matter and the formative agent, “the antecedent to all is love, or oneness, which bifurcates into observer and object (Self)” (2010, p. 142).

Many physicists now hold that our reality clearly shows some kind of free will and design on both the levels of the very large and the very small; the commonality, as demonstrated by their non-locality, is mind. Denker holds this mind of Self and Love, Neshama, Akasha, is the “inspirational creative nexus of ... the quantum levels of reality” (2010, p.95). Laszlo elucidates,

The plenum is no longer formless: its surface is of unimaginable complexity and coherence; its depth is fully informed. The cosmic proto-consciousness that endowed the

primeval plenum with its creative potentials becomes a fully articulated cosmic consciousness—it becomes, and henceforth eternally is, the self-realized mind of God. (2007, p. 147)

Jackson (2002) observes that “according to the esoteric perspective, everything, including consciousness [are] reflections of one source of being, the creator or spirit” (Jackson, 2002, p. 11). Lawrence Cahoon (2009) says, “these considerations point, not inescapably but readily, to the doctrine of panentheism” (p. 790), which claims the divine, whether it is a single God, several Gods, or the cosmic animating force, or field in this case, is in every part of nature and extends eternally beyond it (Hinnells, 1997).

Esoteric science gives us the tools to explain how everything in the physical universe, may essentially consist of crystallized thoughts (or more correctly condensed spirit). This explains a great deal of the mysteries of both physics and consciousness, and provides a simple and compelling framework for a future science, that unifies physics and metaphysics. The understanding that emerges is of a universe where everything is alive and is a reflection of the one source we call spirit (Jackson, 2002, p. ii).

Such extensions of quantum concepts parallel those of many established mystical belief systems. Some of the metaphors and myths involved in various religious teachings and theologies have been likened to the scientific metaphors within quantum mysticism. The Indigenous teachings of the Americas have been compared to quantum holism (Ferguson, 2005). The Field has been likened to concepts in Buddhism, Hinduism and other Eastern and Vedic traditions (Capra, 1975; Kohl, 2007; Duquette, 2011). Each of

the Abrahamic religions, Christianity, Judaism, and Islam, have all also had authors and experts write on the correlations of some interpretations of the quantum with their respective teachings (Brown, 1990; Polkinghorne, 2002; O’Murchu, 2004; Denker, 2010; Lanenberg, 2010). All of these traditions use slightly different interpretations or focus on different aspects or draw different conclusions, but they all rely on the images emerging from scientific observations of the quantum. Ascribing elements of the quantum to aspects of God and how god’s reality is imagined in any of the traditions mentioned above strengthens the pull of quantum science into the realm of religious speculation. Schäfer and Roy turn to Hegel to describe how the quantum is akin to God.

In the philosophy of G. W. F. Hegel (1770-1831), ‘absolute Spirit’ is the primary structure of reality and everything that exists is the actualization of this structure (Schäfer & Roy, 2008, p. 8).

As the great field of consciousness, or the quantum God, is constantly conscious, constantly functioning, intelligently, effectively, in the fashion of a living organism, and as it encompasses everything, including ourselves in some way, we are led to the conclusion that the quantum God is a universal interactive, creative, participatory God (Klein, 2002; 2006; Lanenberg, 2010).

In Hegel’s Absolute Idealism spirit is everything, creates everything, and thinking and being, subject and object, the real and the ideal, the hand, the divine – all are One. To this Hegel added the concept of evolution: God is in our history and in all cosmic processes of becoming (Schäfer & Roy, 2008, p. 8).

The quantum God is thought to be a God who is in and of us and all around us. It never

ceases to create and participate in the overall functioning of our universe, our world, and us. “Einstein himself said that the illusion is that we are separate beings” (Denker, 2010, p. 51). God, in relation to science, is no longer relegated to the gaps to fill in the empty spaces as a fall back explanation. God is the gaps as well as everything in between and everything beyond. As Schäfer writes,

Reality is an indivisible wholeness that is aware of its processes, like a Cosmic Spirit, and it reveals its awareness in the mind-like properties of elementary processes as well as in the human consciousness. Thus, one is led to G. W. F. Hegel’s thesis that the Cosmic Spirit is thinking in us (2008, p. 329).

However this image is received, the strong following of many physicists and theologians discussing and perpetuating such interpretations evokes, for many, the desire to re-think their conceptions of God. The next chapter will examine how some Christian theologians engage the images flowing from quantum science in re-thinking the God of Christianity. While acknowledging many beliefs about the Christian God, the chapter will focus particularly on the action of God in the world.

CHAPTER 4—THE QUANTUM GOD: CHRISTIAN PARALLELS,  
CONSIDERATIONS AND IMPLICATIONS

The previous chapters have laid out briefly the images and concepts of God or the Ultimate that arise from descriptions within certain interpretations of the quantum. Why is this notion so passionately promoted as a God-concept? How does it parallel other concepts of God? How can the quantum field be considered to function as a God would or vice versa? Finally, what are the implications of such images of God? In light of such questions, this chapter will briefly discuss several ways in which the Christian God relates to such interpretations and images arising from quantum science in order to better envision the quantum God.

Although the quantum God has been accommodated, compared or considered by almost every spiritual tradition it has touched, the scope of this investigation can reasonably include only a single comparison. As I am writing from a Western perspective, with a personal history of Catholic education, the Christian God is a natural choice for my assessment of the Quantum's theological implications. In closing this chapter I will discuss these and the greater implications of the analogy of the quantum God.

A Transcendent God and God's Action in The World

The attributes of the Christian God are known to most as omniscience, omnipotence and omnipresence. Other beliefs about God include the following: God is transcendent, beyond this world and our understanding; sovereign, he rules over all; infinite, beyond time and space; immanent, present in all aspects of the world;

providential, caring in an active way; and incomprehensible, unable to be fully known, ultimate mystery. God is also Oneness, unity, the One and only. Of course, Christians also believe that this Oneness is one of relationship between three persons within the Godhead, the doctrine of the Trinity. This doctrine of unity informs, among others, Christian beliefs in the action of God in the world. Finally the supreme teaching for Christians is that God is love.

The parallels of these attributes with those described within understandings of the quantum God above are not a far stretch of the imagination; I have covered quite a few so far. For example: the idea of the unification of the Great Field, the One; the idea this unity may be enabled by love; the transcendent nature of the veiled reality; the unceasing infinite character of the Field; and, finally, the inherent indeterminate mystery of the transcendent field of “pure”, “abstract” probability (Hagelin, 2011). Here, then, I will discuss some theories regarding the Christian understanding of God’s action in the world in light of quantum science. Concepts such as causal gaps produced by probabilities and quantum based parallels to the ideas of unity and love will be considered in this investigation.

In most deistic traditions, God or Gods are believed to act in our world. Their transcendence is able to permeate the veil between our world and their own and have causal effect in our realm. Multivaluing the scientific and the theological here, a dilemma emerges: if nature is constrained by set laws, laid down by God in this sense, how does God, as a supernatural being, act within these constraints? From a scientific materialistic perspective, action denotes a type of energy exchange; with the idea of an external force exerting energy from outside our universe to cause action in our world, the law of

conservation of energy is at risk of being violated. William Brown (1990) critiques Paul Davies' argument that there is not even a need to consider a providential God as the overall balance of energy in the universe even after creation is zero, making an outside source of energy unnecessary.

Davies asserted that the quantum "routinely produces something from nothing" (Brown, p.484), defeating the divine miracle of creation *ex nihilo*. This, to Brown, is misleading, as there has been no discovery of anything being created from nothing. As this investigation has shown, however, there is evidence of our world possibly emanating from and being influenced by some enigmatic realm or force beyond physicality. If we assume for a moment that this place or power is that of the God of the Bible, whose actions are both primary and secondary, where first and foremost God is primarily the creator of all finite things and his subsequent actions in the world are secondary, the question is then how can God be understood as acting in our world without profoundly violating the natural order?

In his article, *Divine Action and Quantum Theory*, Thomas Tracy discusses proposals of noninterventionist direct or objective divine action. This notion implies two things: (1) God created and sustains structures of natural law as a primary work of divine providence and (2) "God might act [secondarily] at points of underdetermination in nature to turn events in new directions that serve God's particular purposes" (Tracy, 2000, p. 894). This view of Tracy's takes into account that God created and allows the world to function according the laws God created, but also God is capable of bringing about change, like responding to prayer, for example. This is of course the traditional teaching, especially in the Catholic tradition.

According to Tracy, if structures of nature are not closed and include indeterministic qualities that sometimes have subsequent noticeable causal effects, God can be thought to act in history by determining some otherwise undetermined events and not disrupt relationships of a finite causal nature. Working off of the assumptions of Nicholas Saunders, that God controls the outcome of measurement, he holds that God could indeed act in some quantum transitions, leaving space for free-will, both God's and our own. Tracy concludes that God acts primarily as the "creator and sustainer of all finite things, with all their intricate lawful order and unfolding potentiality" (2000, p.899). A hermeneutical space is opened for exciting options in exploring God's providential influence in history if our leading physical theories lend credence to an ontological interpretation that holds indeterministic chance in nature as significant.

Given the current state of knowledge...it remains a viable possibility to hold that God might act through indeterministic transitions in quantum systems, and thereby (1) bring about particular effects in the world that were not built into history from the beginning, and (2) do so without *intervening*, if by this we mean interrupting the ordinary lawful operations of the natural order (Tracy, 2000, p.899).

In such endeavours the multivalued framework is clearly being applied. When working with the Quantum, as noted in chapter two, the parallels are natural and not forced. Neither theology nor science is forced to make space for the other, rather both are taken as acceptably true, then compared and considered in search of a coherent

philosophy. This is the position of noted priest and physicist John Polkinghorne, who specialises in the modern relationship between science and religion.

Polkinghorne's approach differs from other notable scientist-theologians like Arthur Peacock, for he avoids an assimilationist position of letting science determine theology and argues in favour of preserving the autonomy of theology and letting it set the stage for the science-theology dialogue (Yung, 2011). He favours a bottom-up approach that begins with experience, more pointedly with Christian faith experiences. Noting that scientific method also relies heavily on the experiences of scientists, along with other similarities to those of theologians, Polkinghorne holds that the disciplines of science and theology have a cousinly relationship. Both are supported by evidence from experience and impelled by motivated belief.

In keeping with this line of thought, he uses analogical method in search of coherent parallels between the findings of modern scientific inquiry and Christian theology, both of which he holds as different yet complementary perspectives of truth in the mutual exploration of our world. In doing this there is "a unity of knowledge which emerges over time as scientists and theologians engage this one world both practically and theoretically" (Yung, 2011, paragraph 12). Polkinghorne views the natural world through a Trinitarian theological perspective and correlates the present scientific understanding with the Trinitarian vision of God (Yung, 2011).

It must be asked then, how does the Christian doctrine of the Trinity figure into this discussion? For Christians it is integral to the dialogue; one cannot discuss the Christian God and not reference the Trinity, especially the role of Christ, in relationship to God's action in the world. In his 2007 book, *Quantum Physics and Theology: An*

*Unexpected Kinship*, Polkinghorne highlights the similarity that the Grand Unified Theories, like that of the Unified Field, have to the trinity of the Christian God.

The three aspects or essences of God in Christianity are God The Father, The Son and The Holy Spirit; “the one true God is believed to be constituted by the exchange of love between these divine persons” (p.100). This is reminiscent of Denker’s idea of love as ultimate transcendent unity. Polkinghorne writes: “The three divine Persons are held to interpenetrate each other in the mutual exchange of love (a theological idea called ‘perichoresis’), a concept that has no analogue in the case of three distinct human beings” (2007, p.102). Drawing from the idea of “Being as Communion” in Christology, he holds an analogous stance that “Being is Relational” (p.103). Connecting this with entanglement, Polkinghorne asserts that our universe, as described by quantum mysticism, “would be a fitting creation of the Trinitarian God, the One whose deepest reality is relational” (p.104). With this idea of being as constant relation with God, Polkinghorne postulates that Christ’s work is a clue to God’s nature.

Kenosis is a term for Christ’s self-emptying to God’s will. Jesus brought revelation and salvation through his life on Earth as human by opening himself to full relation to both humans and to God, as an example to us all, made in God’s image, fully human and fully God. Polkinghorne quotes Irenaeus from the second century (p.85):

If a human being had not overcome the enemy of humanity, the enemy would not have been rightly overcome. On the other side, if it had not been God to give us salvation, we would not have received it permanently. If the human being had not been united to God, it would not have been possible to share in

incorruptibility. In fact, the Mediator between God and human beings, thanks to his relationship to both, had to bring both to friendship and concord, and bring it about that God should assume humanity and human beings offer themselves to God.

The holistic holographic nature of God's relation to the world can be seen through the image of the trinity in the Christian tradition.

In Christianity there is the belief, due to free will, that we are responsible for our own lives, yet at the same time all we do is God's; for God, in God, of God. Quoting the Apostle Paul, Polkinghorne highlights the Biblical stance to "work out your own salvation, for it is God who is at work in you enabling you both to will and to work for his great pleasure" (p.91). He proposes, "divine self-emptying extends to a kenosis of the status of agency, so that the special providence [of God] is exercised as a cause among causes" (Silva, p.3). In this model Polkinghorne uses chaos theory, built upon indeterminacy, to suggest that God may act as the agent which inputs active information. Likened to that of Laszlo's in-formation, it is a non-energetic form of some effective intention, defined not only by its pattern-forming behaviour and causal efficacy, but by its nonlocal connection with the transcendent or God. This information input would not violate any physical laws, would avoid god-of-the-gaps criticisms, as they are ontological rather than epistemological, and would preserve the imperceptibility of divine action (Yung, 2011).

This top-down holistic model parallels that of quantum events. But what of making God a cause among other natural causes? Does God keep a divine status with this understanding? Polkinghorne revised his model, as he holds all scientists and theologians

should remain open to doing, to include both energy and information, as creatures act with energy and a kenosis would involve creaturely action. Polkinghorne's kenosis of agency then suggests the following view:

...Divine action... would be analogous to creaturely activities which involve a mixture of energetic and informational causalities; in this case, God's activity in the world allows for divine special providence to act as a cause among causes.

Polkinghorne's chief...example of such divine action is connected to the kenotic framework of thought itself: the incarnation of God in Jesus Christ (Yung, 2011, paragraph 19).

“Rather than adopting the more prevalent (to science and theology circles) panentheistic model to affirm God as both transcendent and immanent to the world, [maintaining what he calls the theological thickness of his approach] Polkinghorne opts instead to see creaturely ‘freedom’ secured through the divine self-limitation driven by divine love” (Yung, 2011, paragraph 16). A divine kenosis into the limited realm, our world, contrasts the idea of God's foreknowing of all future events, a problem for free will, a divine gift from God. Polkinghorne holds that God possesses “a current omniscience, temporally indexed” (Yung, paragraph 16). This is analogous with what is seen within the quantum; the transcendent uncertain nature of the field encompasses all probabilities, a form of omniscience, yet also depends upon events determined by us within our empirical world to make them real.

Natural causes within the quantum framework can be seen as analogous to the ways in which God is thought to act from a theological perspective. Polkinghorne's

critical realist approach calls for critical openness to the reality of both matter and mind and both science and theology, exemplifying the evocative power of present theories and interpretations of the quantum for the multivalued consideration of complementary pursuits of truth.

### Implications and Considerations of the Analogy of the Quantum God

As this exploration of quantum mysticism has shown, an openness to other methods and resources for understanding is called for by quantum science. They include, philosophy, theology and esotericism. This fact itself speaks to the way in which analogy is necessary and helpful in interpreting whatever it is scientists are observing or inferring. Science and theology both concern themselves with the search for truth; their analogous nature and the use of both by such experts as mentioned in this paper, speak to the relevance of a multivalent perspective when dealing with Quantum interpretations.

Polkinghorne says that we must be “bold enough to make some venture with the matter” (Silva, p.2-3), while acknowledging that quantum theories are still in the realm of speculation, with their intangible mathematical descriptions and the shaky ground of uncertainty upon which they stand. This thesis is contending and illustrating that a multivaluing of approaches is the manner in which to do so. As Stanley Klein asserts in his article *Quantum Mechanics as a Science-Religion Bridge*, the best place to start dealing with the quantum’s mystical and religious implications is to appreciate the similar ground on which they find themselves.

What does this mean in the world? Why is it important? Are all these considerations necessary? Is there a value to science informing notions of God? The common shaky ground, the ground of mystery and ultimate boundaries, that theology and

now quantum science work upon gives weight to the multivaluing of disciplines in building a clearer image of our world, our universe, and ourselves. New horizons birthed by such contact at the boundaries, between not only these separate areas of study, but also those scientific explorations at the very edge of our understanding, are pushing towards what might be called a quantum paradigm of thought wherein everything is connected.

Such quantum philosophies of ubiquitous transcendent mysticism are informing how we understand our universe, concepts of God, and ourselves, according to its promoters. They call forth ultimate questions, pushing them beyond the status of problems to be solved and into the arena of ultimate boundary issues (Denker, 2010). Based upon the theoretical suppositions within quantum mysticism, we have scientific suggestion at least that there may very well be more than our materialistic world and that religious belief and investigation may hold more clout than the empirical paradigm would like to admit. Todd Nicholas Fuist and Thomas J. Josephsohn hold that “cultural resources, including religious beliefs, may be used to assess the meaning and saliency of boundaries” (p. 195). They argue that interpretation and transformation take place at the boundaries, conceptual areas of discord, discourse and dialogue. Such discussions, like those on the quantum God and quantum theology, enable the expansion of horizons and allows for the reimagining of concepts on an individual and collective level.

The texts and films on quantum mysticism and the quantum God can be considered an engaging medium for understanding revelations of the divine. As the religious reader or viewer uncovers the divine pattern of what can be called the mind of God and discovers their possible place in the bosom of the Creator they are encouraged to see themselves as intimate expressions of the great divine. Like any form of revelation

from a Christian perspective, there is a gap between the divine knowledge available and our ability to fully understand it; yet the appreciation and functionality of the information revealed thus far is considered by some to be potentially transformational. To date it has enhanced deep theological questions about the action of God in the world, as seen in the case of Polkinghorne's engagement with related questions.

To many writing on the subject, such as O'Murchu, explorations of the quantum innately calls to action; it is, at its heart, a spiritual calling of the grandest proportions. Goswami holds that the inherent connection to transcendence, through the noetic mystery of our consciousness and our quantum nature at an atomic level, is re-enchanting our notions of persons and of the world at large. Through the metaphor of us all being a fractal representation of something very God-like, human existence then becomes somewhat of a divinely touched experience in a new way. To connect this with the previous section, it could be said that this call is to a kenotic-like opening to the potential reality of divinity, of God, which relates through this kenosis.

Our creative capacity and our innate need for relationship are a Godly mixture of positive potential. Many who adhere to the quantum philosophy hold that compassionate creative relatedness, what can only be summed up as love (Goswami, 1995; O'Murchu, 2004; Denker, 2010), is the ultimate responsibility. It pushes for an active daily participation in our own salvation through an ethics of unity, based upon mutual and all-encompassing respect for the whole and everything it contains. Best and Kellner (2003) relate this to Soren Kierkegaard's affinity for the passion of subjective resolve, choice and commitment, and making ones faith "form and substance of everyday life" (p.3). In

mindfully and passionately living, in a participatory fashion, we can consciously transform our world.

There is an urgent need to re-vision our view of ourselves as co-inhabitants of the planet. As many of us have asserted, with greater or lesser degrees of concern, the current Western worldview has come to the end of its useful life... The participatory worldview, with its emphasis on the person as an embodied experiencing subject among other subjects; its assertion of the living creative cosmos we co-inhabit; and its emphasis on the integration of action with knowing is more satisfying (Heron & Reason, 1997, p. 12).

The quantum paradigm aims to become an engaging movement with a main goal of empowering and motivating the human mind and spirit through deep scientific knowledge, thoughtful theological investigation, and compassionate conscious union. The elevated transcendent status of what was once mundane provides an enlightened perspective that could greatly impact our global socio-political-spiritual atmosphere permanently. Caleb Rosado (2003) believes that the quantum order is pushing our paradigm of understanding, specifically our understandings of spirituality, to “a whole new dimension of consciousness, existence and relatedness beyond the way humans normally experience spirituality within a mechanical worldview” (p.14). He holds,

A growing body of scientists, philosophers, historians, behavioural scientists and spiritual leaders...are now recognizing the development of a whole new way of seeing the

world. It is a major shift in human thinking and of consciousness development, brought about in part by an accelerated movement into the 'imaginational world', which will alter human living as we know it. ... We are on the verge of a radical seismic shift in human development, from 'subsistence' levels of thinking focused on human survival... to 'being' levels focused on human integration and global community (Rosado, 2003, p.15).

These expanding horizons of thought are making way for new ontological and epistemological approaches and, in turn, new approaches to concepts of God: a new postmodern theology. The era of a new postmodern quantum theology of increased interdisciplinary dialogue, which consists of inter-subjective, experiential, participatory commitment and understanding. This is not just an exploration of process theology, or natural theology, or any one area, but a fundamental all-encompassing quantum theology equipped better than ever before to discuss what God may be, how God may work, and how we as conscious beings relate to such concepts of the Creator. What is new is the move beyond only empirically supported conceptions of reality to one that pushes for a more holistic understanding of the world and of how we come to know about it.

Basson and Koekemoer discuss the implications for Christianity in regards to the application of quantum multivalued thinking in ecumenical theology. Schäfer & Roy (2008) hold that the metaphysics of the quantum "lead in a remarkable way to a confluence of powerful traditions... The convergence of powerful traditions of seemingly disparate cultures is particularly important to point out in the present process of globalization, when a unifying view is needed to avoid controversy and conflict" (p.1)

This calls for a theology that is equipped to embrace the diverse, probabilistic nature of our universe. According to Basson and Koekemoer, in our post-modern world, “an epistemological shift based on an expanded rationality is called for. It is in this regard that multivalued-logic emerges as an epistemic model specifically developed to accommodate diversity, uncertainty and probability as well as, to restore hope and faith in the hearts of millions”(1997, p. 276). Amit Goswami proposes that in the future science and religion will perform complementary functions with “science laying the groundwork in an objective fashion for what needs to be done to regain enchantment, and religion guiding people through the process of doing it” (1995, p. 234). Polkinghorne’s re-thinking of the action of God, for example, is but one instance of a re-valuing of science and of theology in light of quantum interpretations.

The conversation around the quantum leaves open the possibility that the world more substantially reflects the likelihood of an ultimate reality, perhaps even an ultimate intelligence. But it is contradictory to say God could ever be truly discovered in the physical world – if so that would not be God. But, as Denker said, although it does not enable us to truly know God, the openness it evokes and encourages provides for the opportunity to have our lives touched by the transcendent divine in some way. To extend Polkinghorne’s ideas of kenosis, opening ourselves to the analogy of God through the quantum, as innately intertwined with the transcendent reality, and self-emptying into the greater whole may enable humans to better understand and relate with our reality

## CONCLUSIONS, LIMITATIONS AND CONSIDERATIONS FOR FURTHER STUDY

This thesis has been an investigation of the interdisciplinary nature of interpretations of data coming from scientific explorations into the smallest and most fundamental aspects of our universe. It has demonstrated that at the quantum level an openness is needed to fully understand reality. It has shown how theology and mysticism have been invited into discussions of the quantum and how a theistic interpretation of the quantum whole has been presented by the sources. The methodology used a multivalued approach to examine the varied images presented within quantum mysticism. This methodology was chosen as it was specifically designed to deal with the quantum and honoured the openness it calls for.

At the opening of this paper, I introduced quantum mysticism. This mysticism is an interpretation of the three concepts of uncertainty, entanglement and duality presently attributed by scientists to an understanding of the quantum level of reality. Those who consider the mysterious and transcendental nature of the interconnected potentiality at the heart of the quantum can follow its lead and value both its physical and metaphysical implications. In translating the fundamental principles of quantum theories into their mystical counterparts of indeterminacy, interconnectedness and idealism, some of those with religious sensibilities often draw an analogy of a God-like concept. The image of a potential holistic, intelligent, effective, infinitely abstract, being-like structure emerges from their collective imaginations. This structure is evoking new images of God.

To review, in chapter one I briefly outlined some main scientific interpretations of quantum science and how they are understood within Quantum mysticism. I showed how

some main sources writing in this area are interpreting the mystical qualities of the quantum in a theistic fashion. Support for how the indeterminate entangled veiled reality, the quantum whole, can be seen as an image of or relating to what could be thought of as something very God-like was then introduced, setting the stage for my investigation.

In chapter two I discussed the multivalued approach appropriate for dealing with the uncertain nature of the quantum. I explained how rational means beyond those of science are also necessary to understanding the reality of our universe when the quantum is taken into account. I then examined the value of metaphor and analogy in the metaphysics that the quantum whole necessitates. Finally, how this metaphysics translates into theology was explored.

In chapter three the quantum God-concept was summarized. I presented the idea that the quantum whole is a type of universal field and how this field is thought to be conscious. I showed how some have been led to believe that the incredibly coherent nature of the universe and the vital function of consciousness at the quantum level denote some kind of grand transcendent intelligence. I then explained how the word God has been applied to this understanding of reality.

Chapter four focused on the parallels of the quantum God with the God of the Christian tradition and the implications of such an image. After quickly outlining some similarities, I explored how such mystical interpretations of the quantum are reconciled within a Christian context, specifically regarding God's action in the world. In closing, I discuss the implications of such understandings of reality and the idea of a quantum paradigm of thought, which values interdisciplinary contributions to the exploration and understanding of our universe and thus provides enchanting opportunities.

The idea that quantum explorations offer analogies to traditional descriptions of God is an important concept to consider. Such an idea calls for the de-compartmentalizing of our over-mechanistic approaches to the world and the multivaluing of disjointed perspectives. This does not mean that these understandings are certain fact to be held as static truth, but, as this paper has shown, that this information is a jumping-off point, full of abstract possibility and unified diversity.

While my research has investigated the mystical interpretations of quantum science and demonstrated the value of analogy and resources beyond the scientific in light of investigations in to the quantum, there are of course caveats to approaching quantum theory and quantum mysticism. As I have mentioned, they are still in extremely developmental and experimental territory, even with their demonstrated and practical applications. The same is true for the field of noetics. Change and progress are inevitable as new data is collected and interpreted and new analogies may be drawn, demanding further openness when approaching the quantum world.

Additional shortcomings of this study are due to the limitations on time and scope. They include the omission of various concepts, such as the quantum soul (Hameroff & Chopra, 2012) and quantum healing (Chopra, 1989), which would have digressed from the purposes of this paper, yet still hold relevance to those studying the relationship between science and religion. It is clear then that such interpretations of the quantum necessitate further consideration into the future of the relationship between science and theology. Further investigation into the study of consciousness is also necessary to gaining more insight. Its murky, enigmatic yet essential status in our existence also calls for sincere and humble interdisciplinary scrutiny.

Both science and theology have their place in the exploration of our reality and analogies drawn between the two further expand our understanding. The multivalent approach I have used has enabled me to fractal the use of the quantum perspective's openness to new perceptions and discoveries, as well as its appreciation for varying perspectives within my investigation of the analogy of the quantum God. Quantum theories seem to return to a pre-modern sensibility and understanding of the world and at the same time push towards a postmodern perspective. They challenge the mechanistic paradigm of modernity and construct new images of God and the universe. In line with this, if the quantum and the spiritual are both real objective and subjective things in our reality both must be considered in the global effort to understand our universe.

Plato's idealism held that everything is a single substance and that our world is but a shadow world of the true reality of perfect hidden forms. The sixteenth century philosopher George Berkeley proposed that everything exists in someone's mind. Religious traditions all over the world have held strong to the idea of abstract transcendent unity at the base of all that is since the dawn of written history. Schäfer quotes Pierre Teilhard de Chardin as writing "science, philosophy and religions are bound to converge as they draw nearer the whole" (2008, p.349). The quantum world is the nearest to the whole we have ever found ourselves and, as Peter Russell puts it, "although science doesn't realize it, once it embarks upon this exploration and begins to delve into deep mind, it is going to find itself confronting the one thing it has avoided and denied for so long—the nature of God" (1999, p.65). Those in the practice of studying religion and theology should take this claim seriously as the relevance of the quantum in their arena is only growing with time.

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