
QUANTUM THEOLOGY

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A Crossroad Book
The Crossroad Publishing Company
New York

1997

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1997

The Crossroad Publishing Company
370 Lexington Avenue, New York, NY 10017

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Printed in the United States of America

Library of Congress Cataloging-in-Publication Data

O'Murchu, Diarmuid.
Quantum theology / Diarmuid O'Murchu.
p. cm.
Includes bibliographical references and index.

1. Quantum theory. 2. Physics – Religious aspects – Christianity.
3. Theology. I. Title.
BL265.P4048 1997
231.7–dc21

96-49656
CIP

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Acknowledgments

This book feels more like a *process* than a *product*. It draws together the ideas and dreams of many people. In recording my gratitude, I do not differentiate between the living and the dead, because in a quantum world, these are merely two dimensions of the one-life experience.

Theologically, I belong to the Catholic tradition, often perceived to be restrictive and legalistic. For me, it has been a fermenting ground of many questions and few answers, abetted by inspiring people to whom I owe so much. Chief among these are Pierre Teilhard de Chardin, Ladislaus Boros, John Macquarrie, Karl Rahner, Mary Daly, Ursula King, Sallie McFague, Gustavo Gutiérrez, Leonardo Boff, Mary Grey, Katherine Zappone, and Thomas Berry.

Scientifically, I am very much a late developer, and I cherish deeply those colleagues and friends whose patience and tact opened up for me the wonders of science, reassuring me, time and again, that what I was talking (writing) about made a great deal of sense (and, occasionally, a good deal of nonsense!); in this context, Paul MacAlevy and Chris Elliot merit special mention. I have engaged with scientific exploration as much through books as through people; from a quantum perspective, ideas are rich in potential whatever their source. Whether through personal or written contact (sometimes, both), I wish to record my indebtedness to David Bohm, Stephen Hawking, Ilya Prigogine, Paul Davies, Danah Zohar, Kitty Ferguson, Peter Russell, James Lovelock, and Rupert Sheldrake.

Dialogue is an invaluable resource to clarify ideas and unearth their deeper meanings. My special thanks to those who have befriended and encouraged me in my quantum explorations, particularly Frances O'Kelly, Elizabeth Smyth, Kathleen Lyons, Sion Cowell, John Woodcock, Maura Corbett, John Doyle, David Smith, and the provincial of my religious order, Ciaran MacCarthaigh, for his continuous support.

In preparing this manuscript for publication John Eagleson was meticulous with detail and gracious with advice. I very much ap-

be understood in the narrow linguistic sense of a special set of words which state what reality is, or determine what it should become. This literary understanding and application of concepts is very much the subject of modern linguistic analysis, highlighting the relative nature, on the one hand, and the symbolic significance, on the other, of all spoken language and written text (see Alston, 1989, and the valuable feminist critique in Nye, 1990).

From within the Christian tradition itself is a rich, inclusive, global sense of *logos*, which dominates the opening verses of John's Gospel, and is specifically outlined in the Hebrew Scriptures, where *logos* is translated as *dabbar*, meaning wisdom as a creative, divine energy. The task of theology, therefore, could be understood as an exploration of that wisdom which awakens and sustains the creative impulse of life. Central to this inquiry is the ability to *listen*, to be open and receptive to the life-giving energy of the divine *logos*. According to Collins (1995, 226), "It is increasingly in the cathedral of the environment that our contemporaries are rediscovering a way into the realm of the transcendent; they are discovering the sacred presence that stands behind the natural world."

It may sound sophisticated and grandiose, but in fact humans have been exploring spiritual meaning from time immemorial. When we examine primitive (so-called) and prehistoric religious behavior, we find a wealth of custom, ritual, and ceremony, not bestowed by a formal religion, but invented by the human imagination as a means to discern, accommodate, and internalize the primitive fascination with mystery.

Long before we humans ever invented the formal study of theology, people *did* theology. They grappled intuitively and ritually, sometimes in awe, sometimes in fear, with the encircling mystery of life. Long before they thought of God as a divine being, they felt and celebrated a sacred presence which evoked in them feelings of amazement and trepidation, respect and intrigue, but above all a reassurance that, despite everything, the ultimate mystery of life is benign and benevolent.

Over the millennia — some seventy thousand years — we humans lived in a spiritual ambience.¹ We sought and discovered meaning in the events and experiences of daily life. We sensed the frightening, yet benevolent, power of the divine in the rhythms of nature, in the changing seasons, in the warmth of sunshine, the light of the moon, the destruction of storm and thunder. The entire universe was alive with potential meaning, perceived for over thirty thousand years as a Divine Mother of prodigious fertility and nur-

ture; fortunately there were no theologians around to accuse us of pantheism.

Then came the Agricultural Revolution (around 8000 B.C.E.) and with it the insatiable desire to control the precarious elements of life, including the religious ones. We began to take over the planet and claim it as our own, dividing it into segments, later known as continents and nations. We began to master and control the environment, and we didn't know when or where to stop. We even invented warfare so that we could conquer and control every alien force.² ☺

Prior to this time, quite a different worldview prevailed. Despite occasional tendencies toward cannibalism and other macabre practices, Planet Earth was revered as the Great Mother Goddess, birthing forth a prolific variety of life, the sacredness of which dominated all other concerns. Prehistoric cosmology sometimes engenders a sense of fear and trepidation, as people confront the vast unknown, but far more prevalent is the feeling of being at home in Planet Earth, nurtured and sustained by its egalitarian and prodigious creativity. Consequently, rivalries between nations, races, and religions were largely unknown and warfare, as a dominant mode of declaring superiority, is very much an invention of the postagricultural era.

The craving to dominate took on diabolical proportions. Tribal and ethnic groups vied for ultimate supremacy, as Planet Earth was carved into sections and nations. Finally, we humans tried to conquer and control the Godhead itself, that divine, mysterious force, that fascinates, puzzles, and frightens us. And how did we decide to do it? By inventing religion!

Religion is one of the great anomalies of our evolution as a human species. It is the instrument with which we tried to gain supremacy over the Godhead itself, by anthropocentrizing the divine power and molding it into a system of duties and expectations of our making. In the name of religion we have invented a litany of gods, many made in our own image and likeness, and not a few serving as projections of our own distorted will-to-power. Religion is the greatest idolatry of all time, and in many ways, the most dangerous also.

The major religions known to us today came into being in a time span of about forty-five hundred years (3000 B.C.E.–1500 C.E.). Formal religion is a very recent visitor to Planet Earth. It has been around for about 5 percent of humanity's spiritual journey, which began to unfold about seventy thousand years ago.

That religion should have arisen as part of the ethos of the Agricultural Revolution is understandable. One could even argue that it was appropriate and necessary for that phase of our evolution as

a human species. What we cannot escape is that we as a species have outlived that phase of our evolutionary development and so, quite appropriately (it seems to me), thousands of people are leaving religion aside, no longer feeling the need for it. One of the most precarious dilemmas of our time, however, is the vacuum created by the demise of formal religion.

Theology and Spirituality

Most of us have grown up with a religious legacy. Even those who have never partaken of a formal practice of their faith carry within them cultural norms and expectations. Our surrounding culture is heavily tinged with religious symbol, feeling, and expectation. I don't wish to deny that religion has brought benefits to our lives and to our planet. My concern is that it is, and for some centuries has been, overshadowing a more fundamental human aspiration, namely, spirituality.

The word "spirituality" has several meanings. I use it with a very basic connotation: the human search for meaning.³ All of us, all of the time, operate out of a sense of being connected to an inner core of meaning. Thompson (1990, 196) even suggests that the autonomic nervous system communicates and transmits information in order to enhance meaning. A DNA helix can validly be spoken of as carrying meaning because it bears information which is transmitted, received, and interpreted in terms of protein structures used to build the body and enhance the quality of life.

Throughout life, we humans are exploring meaning, searching for it, and imposing it where we feel it doesn't exist. We cannot do otherwise; it's our very essence as human beings. We're creatures of meaning and the drive toward meaning comes from deep within — not just within ourselves, but also, I dare to suggest, from deep within creation itself. In this context, therefore, spirituality is planetary (and cosmic) as well as personal — which may be another rendition of the feminist claim that the personal is political.

From the beginning of our evolution as a species, we have been exploring and expressing our spirituality — with both its light and shadow. Not everything in our spiritual unfolding is necessarily good — but always activated for a perceived good. The spiritual search, the pursuit of meaning, has several mediations and expressions. We worship several gods, many of which are false, including some of the most cherished in our formal religions.

Our spiritual identity is inescapable; without it we simply wouldn't exist. How we enculturate and express it is a separate question, which I have explored in another book (O'Murchu, 1986). Religion is one aspect of our spiritual unfolding, but only one. Our spiritual evolution as a species took place for an estimated seventy thousand years without formal religion, and there are many indications that we are, once more, evolving spiritually into a nonreligious ambience. As a human species we are outgrowing our need for formal religion.

It seems important that we differentiate between *spirituality* and *religion*. Spirituality is inherent to the human condition — also to planetary and cosmic growth; in my estimation, religion is not. Spirituality has an enduring quality, coterminous with human evolution; religion serves a transitory and temporary purpose.

Theology, therefore, has a great deal more in common with spirituality than with religion. Theology belongs to the primal and primordial aspirations that underpin the search for meaning, predating religion by thousands of years. When our ancient ancestors grappled with the mystery of life, even at the "primitive" stage of prearticulate speech, they were already doing theology. They were connecting with the divine energy; they were opening their hearts and minds to divine wisdom.

By adopting theology as a (religious) phenomenon, and using it — as happened for much of the Christian era — as a tool to suppress and oppress others (pagans, infidels, heretics, among a range of other labels), we humans were debasing one of the oldest and most sacred of the sciences. Since it is also one of the most creative and subversive fields of exploration, it is understandable, if regrettable, that we sought to curtail its influence.

Contemporary Theology

Formally, theology still belongs to official religion, and in its general usage it is almost exclusively a Christian concept. Informally and unofficially, it is a powerful ferment for thought, reflection, dialogue, and provocation. It is emerging as one of the most multidisciplinary of all the sciences and in recent years has assumed new political, global, and cultural significance (see Lash, 1986; Hopper, 1987; Liechty, 1990; Krieger, 1991). The new theological agenda is multifaceted, as can be gleaned from four recent developments which I outline briefly.

personal context. Each religion is understood to be a cultural, historical attempt at contextualizing the one divine plan of revelation and salvation. This is not to say that all religions are equal, or that one religion is as good as another. Rather, it declares that each religion is right for its time, that each offers a partial and limited view of reality, yet each can genuinely lead us to God and communicate God's design for ourselves and for the world.

As a new theological paradigm, the multifaith dialogue is only beginning to create an impact, and it seems that it will be quite some time before the religions will feel free and safe to participate as equal partners in the dialogue. Meanwhile, the dialogue raises even more acute concerns beyond the formal agenda of multifaith research:

- a. The perception that all religions, even the so-called revealed ones (Christianity, Judaism, and Islam), are human attempts to construe and contextualize God's revelation to humanity.
- b. The fact that each religion — and religion in general — perpetuates forms of idolatry which have caused, and continue to cause, immense pain and suffering in our world.
- c. The possibility that the religions, understood in evolutionary terms, properly belong to the Age of Patriarchy (c. 8000 B.C.E.—2000 C.E.), and may have diminished importance for humanity as we move into a new evolutionary epoch.
- d. The fact that although in the past religion was the chief means through which people explored and articulated their spiritual desires and their search for meaning in life, today increasing numbers of people are discovering their spiritual identity in contexts other than those of formal churches or religions.

As a new paradigm the theology of interreligious dialogue relativizes the very foundations that theology has always taken for granted, namely, religion and religious belief. As that basis is progressively eroded — which does not necessarily mean a world engulfed in atheism and agnosticism — theology will begin to outgrow its narrow religious niche in preference for the open arena of the world. Some people would consider this to be the end of theology, and, indeed, multifaith dialogue is only one of a number of recent developments that pushes theological exploration toward renewed and enlarged horizons.

Conclusion

These theological trends, and a host of others that could be named,⁶ invite us to engage in a new theological discourse. The spiritual landscape, rather than the religious tradition, has become the arena for theological exploration. And the theological excursion may no longer begin with God and work downward; rather, it will originate in the human experience of searching and seeking and move outward to embrace ever wider horizons of life and reality. Like the universe itself, our theological parameters are expanding, not contracting. The *context* in which we do theology is becoming as important as the science of theology itself (see Bevens, 1992).

To this day the Christian church claims a monopoly over theological discourse and conscientiously believes that it has a duty to safeguard the purity and integrity of doctrine. Meanwhile, theological exploration — by which I understand the human attempt to grapple with divine-human co-creativity in the world — is outstripping not merely its ecclesiastical context, but even its religious one. The emerging theological agenda is based on questions from the world to the world; the earthly and cosmic dimensions can no longer be ignored or relegated to a secondary role. If the churches and religions wish to be involved they seem to have little choice other than dialogue with the world of our time.

Instead of feeling threatened and responding in a negative and defensive fashion, surely the churches and the religions can find here a moment of liberating grace to allow and enable the world to take future responsibility for that treasure which the churches and the religions have reserved to themselves for so long. Are our churches and religious institutions broad-minded and big-hearted enough to cut the proverbial apron-strings and entrust the theological heritage to a new parent or, perhaps more appropriately, to its own emerging maturity?

This book sets out to explore another theological horizon: the mystery and meaning inherent in the quantum theory. This is not an attempt to make science sacred, godly, or holy; rather, it is an exploration of the divine co-creativity emanating from one of the most ingenious scientific discoveries of the twentieth century. Nor is it a new way of exploring the dialogue between science and religion (outlined in comprehensive review by Rolston, 1987, and Barbour, 1990). No, it is a great deal more, embarking upon a creative threshold that will push both the scientific imagination and the religious fascination to new frontiers unknown to previous generations.

situated elsewhere, my perception — in minute details — would be considerably different. In other words, inmately I perceive in wholes, not in parts; my brain is tuned to perceive wholistically.

Wholistic Consciousness

The work of Karl Pribram (1971) in the 1960s and 1970s confirms these discoveries in his holographic model of the human brain. The brain, functioning as a hologram (described below on pp. 55-56), interprets bioelectric frequencies, not at individual centers, but throughout the brain. Information is not localized but spread throughout in wave-like, frequency patterns along a network of fine fibers on the nerve cells. Only such a model could interpret and understand our holographic, wholistic universe.

Danah Zohar (1990, 1993), acknowledging the holographic model of mind and consciousness, seeks to push the quantum vision even further. She proposes a quantum, mechanical model of consciousness to explain how the brain and its neurons can act in a coherent, unified way. The necessary physical mechanism, which functions at normal body temperature, seems to be similar to the “pumped system” of electrically charged molecules (dipoles) first described by Herbert Frohlich (1968). When energy is pumped into electrically charged molecules, a threshold of excitation is reached beyond which the molecules begin to vibrate in unison. They do so increasingly until they pull themselves into a highly ordered form known as a “Bose-Einstein condensate.” When all membranes vibrate sufficiently to pull themselves into the most coherently possible form of order, we have a Bose-Einstein condensate, with the aid of which we can distinguish conscious from nonconscious systems: In Zohar’s own words:

Evidence for coherent states (Bose-Einstein condensates) in biological tissue is now abundant, and the interpretation of its meaning lies at the cutting edge of exciting breakthroughs in our understanding of what distinguishes life from non-life. I think that the same Bose-Einstein condensate among neurone constituents is what distinguishes the conscious from the non-conscious. I think it is the physical basis of consciousness. (Zohar, 1990, 67-68).

Zohar works on the assumption that consciousness is a property of all living systems and, in a quantum context, becomes the basis

not merely for awareness, but more importantly for relationships, an innate potential for (mutual cooperation) between all beings and systems within the one quantum universe. In this model, the dualistic dichotomy between observer and that being observed itself breaks down; the collapse of the wave function leads only to reductionistic confusion. Instead, it is suggested that observation gives way to relationship, a complex mode of interacting, fluctuating between giving and receiving, until a sense of resonance (see Taylor, 1991; Metzner, 1987) emerges, whereby the individual parts (giver and receiver, observer and observed) lose their dualistic, independent identities, but rediscover a sense of the “quantum self” in the interdependent relationship of the new whole, which might be anything from the marriage of two people to a newly felt bond with the universe itself.

Living systems are by their very nature neither subjects alone nor objects isolated, but both subjects and objects in a mutually communicating (and defining) universe of meaning. At a deep level, each living being is implicated in every other. Each suffering, each extinction, affects us and impoverishes us. Similarly, we partake of the joy and creativity of each individual organism. The capacity of organisms to evolve thus depends on their capacity for communication. This deeper truth has been ignored by neo-Darwinian theory, which sees evolution only in terms of competition of the fittest in the battle for survival. Ultimately, it is not the individual species which evolves as much as all living systems connected interdependently within a coherent whole.

Contemporary advocates of the quantum theory, while acknowledging the historical significance of the Copenhagen interpretation (which, among other things, claims that the observer influences — to the point of determining — the outcome of any experiment or observation), no longer adhere to its anthropomorphic impact. We humans do not and cannot determine the final outcome, except by a quality of interference and control that is often deleterious rather than beneficial to progress and growth.

We humans are not the masters of creation; we are participators in a co-creative process that is much greater than us and probably quite capable of getting along without us (as happened for almost fifteen billion years before our species evolved). If we are to influence global and planetary life, we’ll do it in cooperative interaction rather than in competitive strife. Our interrelationship with life — at both the micro and macro levels — is a learning process of mutual interdependence, and not that of exploitation, combat, and warfare, a lethal process which is almost certain to destroy us in the end.

We can now return to some of the key concepts of the quantum theory and explore their meaning in the light of our new vision.

Cause and Effect

ii → In a quantum universe, all life is understood to operate within the context of relational interaction. Everything is affected (rather than caused) by everything else. The poet Francis Thompson seems to have imbibed this view when he wrote: "Thou can't not stir a flower without disturbing a star." At the observational level, my action of turning on the TV may be described as cause and effect. The quantum vision invites (and challenges) me to the realization that such an "effect" is only possible in an electromagnetic universe; my ability to move my hand in order to push the switch is also affected by the universal law of gravity. There is a great deal more to switching on the TV than mere cause and effect. In fact, cause and effect has to do with the "part" which can be fully understood only within the wider, global "whole."

Determinism

* In a quantum universe, nothing is predictable, and the idea of life being in any way determined is abhorrent. Quantum theorists very much like the word "probability" (for which Heisenberg's uncertainty principle⁹ is a basic tenet). Surprise, expectancy, wonder, creativity, beauty, and elegance are the kind of words that enable the quantum scientist to make sense of reality. ← ← ←

* There is a shadow side to this description which goes something like this: if the universe is not determined by an external agent (e.g., God, as both Newton and Einstein believed), then we can begin determining and controlling it for our own self-aggrandizement. Let me emphasize: this is *not* quantum theory in its purity (if there is such a quality of theory); this is an aberration of what the original theorists conceived. Throughout the 1940s and 1950s it became the dominant orientation of the scientific and medical communities, and it still prevails, although its prevalence is beginning to wane in the face of recent scientific awareness and the challenge of a growing wholistic consciousness.

||| In abandoning determinism, the proponents of the quantum theory were, inadvertently, advocating a quality of mystical receptivity: be open to the unfolding (evolving) nature of life at all levels. Life is not determined by blind external forces; it is affected, for weal or for

woe, by the quality of our respect for its inherent processes and our willingness to interact with (relate to) all life forms in a gentle, non-exploitive, cooperative manner. Modern ecology, with its acute sense of planetary homeostasis, is deeply in tune with the original dream of the quantum physicists.

The Whole Equals the Sum of the Parts

Although quantum theory is widely accepted in scientific circles, there are very few scientists who understand it fully or who claim to be able to explain it in a simple and succinct way. I would submit that quantum theory is complex, but not necessarily complicated. The human body—a prime example of quantum theory at work—is highly complex, yet exhibits an amazing sense of order, rhythm, and purpose.

What makes the human body special is the complex interaction of so many forces and energies that we do not (and cannot) observe in everyday life. There is no scientific, sociological, or psychological means of measuring the intimacy and exhilaration of courtship, the eroticism of sexual embrace, the ecstasy of contemplative prayer, the gripping excitement of sport or achievement, the placid serenity of a beautiful sunset, or, alternatively, the rending terror of pain and suffering or the mental and physical exhaustion of agony and torture. In all these situations, and in many others, what is happening in the whole person can be neither analyzed nor understood in terms of some or all the parts of the human personality.

For the quantum theorists, the fact that the whole is greater than the sum of the parts underpins all reality. For everything in life, there is more to it than meets the eye. The real essence, and the real meaning, is deep within, which in effect often means both inside and outside the object we are observing.

Like many discoveries in the early years of the twentieth century, it took some thirty to forty years before the new quantum awareness seeped through the sturdy barricades of rationalism and conservatism. Eventually the barricades began to crack and crumble. It all hit us in the 1960s as "bundles of energy" seemed to be cascading from all quarters. Among the leading discoveries was that of the quark assemblage, generating a precocious sense of excitement that the long-sought fundamental "building blocks" might at last be nailed. But nature was speaking a different language, and its quantum significance we'll review in a later chapter.

In modern physics, the image of the universe as a machine has

struments such as the drum (see Swimme and Berry, 1992, 44), rasp, rattle, and harp were used. In prehistoric times, music was considered to have magical qualities, facilitating communication with the gods, and capable of driving away evil forces. Music was used to induce altered states of consciousness in an attempt to realize in oneself and awaken in others (and in nature) the God-consciousness which pervades all life. According to some theorists (e.g., Hayes, 1994), music is based on notational structures which reflect the fundamental design of nature itself (e.g., the predominance of combinations of *three*, further explored in chapter 7).

Our ancient ancestors seem to have had an intuitive appreciation of music as a primordial, archetypal form of sound. And that sound was a creative energy — a vibration resonating through the instrumentation of created forms. Thus, the original power of creation is described in many religions as the power of sound, which in Judaism and Christianity we refer to as the "Word." As already indicated, the Aramaic *dabbar* does not mean "word" as understood linguistically, but rather an irresistible creative energy exploding into voluptuous and prodigious creativity (see Fox, 1984, 35-40).

Music, song, incantation, droning all embody this primordial, creative potential which animates the created order. It is not by accident, therefore, that contemporary physicists are rediscovering the musical undercurrent to our creative universe. Echoes can be detected in the fascination and controversy engendered by *superstring theory*, which postulates that the fundamental energy that enlivens everything in the universe may be compared to the vibrating energy that occurs when we move the bow over a musical string, the music being the "voiced" language of the silent energy. Swimme and Berry (1992) make liberal use of the music metaphor and in a rather inspirational passage (p. 40) describe humanity's role as a sounding board for a universe that is essentially melodious in nature.

For science and theology alike, I believe we are touching here on a truth of great depth and originality. The medium of scientific research can no longer be constrained by classical categories nor by traditional methods of observation and measurement. We can conceive of a universe in which the spheres themselves are dancing, and from the musical vibrations we are beginning to glimpse a whole new sense of what the universal life is about. In the poetic words of Davidson (1989, 402), we are invited to dance "according to some higher strings."

The energy that animates and enlivens all life may well be super-sonically melodious, and the life force itself may be something more

akin to an orchestra than to any spiral of subatomic particles. These considerations enable us to formulate our first principle of quantum theology:

There is more to our world than what can be perceived by the human senses or envisaged by the human imagination. Life is sustained by a creative energy, fundamentally benign in nature, with a tendency to manifest and express itself in movement, rhythm, and pattern. Creation is sustained by a superhuman, pulsating restlessness, a type of resonance vibrating throughout time and eternity.

The God Question

Theologians in general are not likely to quibble with these ideas, but those of more orthodox leaning will question our starting point, which is not God, but rather our experience of the world as perceived with the quantum imagination. Even in the specific terms of quantum mechanics, the universe is fundamentally mysterious. We can break down its constituent parts and reassemble them. No problem there! When we try to understand how the parts interact and function for the sake of the whole, then the mystery begins to unfold, and we confront questions of ultimate meaning that concern theological discourse. At the heart of that mystery is the sense of a superhuman, creative restlessness.

The reader will notice that I refrain from using the word "God." I do so for a number of reasons:

a. Traditionally, theology began with God and the divine revelation as disclosed through the "deposit of faith" as contained in sacred writings (the Bible) and their interpretation by lawful (church) authorities. In that context, only those who believed in God (as described by formal religion) could be theologians. Quantum theology seeks to dismantle this exclusivity and open up the theological exploration to everybody, to all who are prepared to engage with their lived experience of the universe as a quantum reality.¹¹

b. In traditional theology, there tends to be an emphasis on the God who creates from nothing (*ex nihilo*), and is therefore superior and external to the created order. Even in an incarnational religion like Christianity — with the focus on the God who becomes human in the midst of creation — the God "up above" often takes priority over the God who is immanent in the world of our experience.