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CHRIST AND THE QUANTUM: FUNDAMENTALS OF THEOLOGY OF SCIENCE

Abstract. In light of recent scholarly dissatisfaction with 'science and religion' as the preferred nomenclature for an international research discipline, I explore the terminology of 'theology of science' as a way of clarifying the problems and aims. I engage with other recent proposals for theology of science, especially with their Christological interests. I suggest that theology of science explores what it means to hold Christ the Logos as fundamental to natural philosophy. In this light, I discuss the physical worldview of 'quantum fundamentalism,' and I examine realist quantum interpretations to see how theology of science might adjudicate between them. I conclude by addressing the question, 'What was God thinking when he created the quantum world?'

Keywords: science and religion; theology of science; quantum fundamentalism; quantum religion; Christology; Copenhagen interpretation; quantum interpretations

1. INTRODUCTION

Since around the late 2010s the science-and-religion field has found itself in an impasse as scholars disagree over its customary nomenclature. The point of disagreement concerns whether a suitable identifier can be found to neutralise the anachronism and essentialism inherent in the 'science and religion' terminology. 'Science-engaged theology' has gained particular attention as an alternative, but some (including myself; Harris, 2024a) favour 'theology of science.' This present paper engages with recent discussions concerning the scope of theology of science and examines what may be called 'fundamental' commitments in the area. These commitments are two-fold: theological (concerning the role of Christology in creation theology)

and scientific (concerning the role of quantum physics in the natural sciences). Exposing the fundamentals allows me to raise a penetrating question to which theology of science is particularly suited: 'What was God thinking when he created the quantum world?'

In this paper, I begin with an overview of the current impasse in science and religion (section 2), and of the theology of science proposal (section 3), before I discuss (section 4) the implications for theology of science when the creative activity of the divine Logos is affirmed as axiomatic. In sections 5 and 6 I present a case study, that of 'quantum fundamentalism' (Harris, 2024b). By taking the incarnate Son as the fundamental ground of a realist natural philosophy (section 7), I suggest that theology of science can make progress on the problem of the underdetermination of quantum interpretation. In this light, I examine the realist quantum interpretations and suggest that pilot-wave theory (the de Broglie-Bohm interpretation) is of particular Christological interest. This move allows me to circle back to the question of God's intentions in creating the quantum world.

2. THE IMPASSE OF SCIENCE AND RELIGION

What is in a name? A very great deal when it comes to a scholarly discipline. How does a new disciplinary identity arise among like-minded scholars, and, once those scholars have agreed that such a new discipline has arisen, how does one secure its boundaries when, almost by definition, scholarly research is constantly changing? The name of the discipline – its identifier – can do a useful job of work here, providing a measure of stability and unity to its practitioners as the discipline evolves. For mature disciplines, we often find that the discipline goes by the same name as its core epistemology. Atmospheric physics, biochemistry, political science, and literary criticism are all examples of disciplinary identifiers which refer directly to the body of knowledge of interest, and which give some indication of how that knowledge is to be treated. In such cases, the disciplinary

identifier remains stable for many decades, even though the research questions continue to evolve therein. And while researchers in these areas might often focus on interdisciplinary questions with experts from other disciplines, yet the researchers' primary identifier captures a great deal about their professional training, and their particular epistemic interests.

But what do we do when a field of enquiry arises that is focused on the *border* between two quite different epistemologies, especially when we find that this border is no such thing, but is more in the nature of a contested territory with fluid boundaries of its own, and with a very uncertain topography and ownership to boot? What do we call this contested territory, and how do the scholars who are interested in it identify themselves? Does the name make a difference, if the entire area is so fluid and uncertain? Yes, the name makes a significant difference, I suggest.

I am, of course, thinking of the 'science and religion' research area, and its variants such as 'theology and science,' all of which refer to much the same thing, namely study of the relationship between the empirical sciences and religious belief. For we now find that the name – 'science and religion,' and its variants – is by no means a mere convenience, nor is it cosmetic; instead, the name has a bite, influencing the kinds of research question tackled by scholars. In short, the disciplinary identifier influences the epistemology.

There has been recognisable scholarly activity in 'science and religion' since at least the time of the Darwin debates of the mid- to late-nineteenth century, but the modern scholarly area tends to draw its point of origin from Ian Barbour. In his early work, Barbour (1966) set out our field of enquiry as effectively residing in the problem of how to relate the two epistemologies represented by philosophy of science and modern theology. In such terms he began to formulate a distinctive science-and-religion methodology where scientific and religious forms of reference could be compared and contrasted, notably by means of his key concept of 'critical realism,'

which is still in widespread use today. This distinctive methodology became most clearly crystallised in Barbour's four typologies of conflict, independence, dialogue and integration. These typologies have been extended, refined and critiqued by other scholars, and in innumerable ways.

For, in spite of the widespread agreement among contemporary science-and-religion scholars that Barbour did so much to define our field of enquiry, yet we continue to disagree about the meaning and utility of his distinctive science-and-religion methodology, and no consensus has emerged, nor a replacement methodology. The disagreements have become so wide-ranging and so fundamental that some prominent figures have begun to argue that it is time we revise (or even abandon) the terminology of 'science and religion' altogether.

The basic problem arises from the infamous thesis of conflict between science and religion which Barbour and later scholars have done so much to counter. We are now all too aware of how significant that conflict thesis has been for forging our self-identity as scholars of science and religion. But since that conflict thesis has been so thoroughly dismantled, we find ourselves asking whether there is any further need for a scholarly discipline called 'science and religion.' More to the point, we find ourselves asking whether, by continuing to use the name 'science and religion' to refer to our activities and interests, we are not resurrecting the conflict thesis all over again. Such is the argument that has been gathering momentum in science-and-religion circles since Peter Harrison's book of 2015, *Territories of Science and Religion*, and which came to a head in the 'After Science and Religion' movement led by Peter Harrison, John Milbank and Paul Tyson (Harrison, Milbank, 2022). This movement argues that, since we are in a new phase – after the flaws of the conflict thesis have been exposed – we need to abandon the 'science and religion' terminology that accompanied it, along with notions of 'dialogue,' which were no such thing in reality, goes the argument (Harrison, Tyson, 2022).

3. THEOLOGY OF SCIENCE

Some voices argue that the old terminology of science and religion should not be abandoned (Reeves, 2023), but many theologians working in science and religion have been keen to explore new terminologies, especially 'Science-Engaged Theology' (Leidenhag, 2024). At the same time, 'theology of science' has been proposed as an alternative (McLeish, 2018; Harris, 2024a), and one which offers useful parallels with other long-established elements of science and religion, most obviously philosophy of science, history of science and philosophy of religion. But in fact, the great Polish philosopher and physicist, Michał Heller, had proposed 'theology of science' as one such identifier many years ago (Heller, 1996).

The methodology of theology of science has not settled, however, and this is quite deliberate in my own construal. Just as philosophy of science, history of science and philosophy of religion capture a wide variety of interests and approaches while still being fundamentally philosophical or historical, so, I suggest, theology of science should capture a wide variety of theological interests and approaches to the empirical sciences. Accordingly, I am not concerned to limit theology of science – as a disciplinary identifier – to a particular confession or orthodoxy, nor to specify how it should relate to the sciences.

Hence, I suggest that theology of science need not be exclusively Christian, but could stand for analytic religious thought from other confessions and traditions. But just as the science-and-religion area has been dominated by Christian thought, so is current scholarship in theology of science, although the outlook on the sciences is not uniform. Paul Tyson's theology of science (2022), on the one hand, is reactionary, hoping to re-gain something of the cultural authority that theology has steadily lost to the sciences, while other recent studies are more constructive in relation to the sciences, inspired by Heller's original vision (Oleksowicz, 2020; Sierotowicz, 2023; Marcacci,

Oleksowicz, 2023; Sierotowicz, 2024; Rodzeń, Polak, 2025). I regard my own approach to theology of science as falling into this latter group. A striking point of consensus has emerged from these latter studies, a specifically Christian and fundamental point. That point I am calling 'Christological fundamentalism.'

4. CHRISTOLOGICAL FUNDAMENTALISM

The Heller-inspired studies follow his lead in emphasising the rationality and intelligibility of the physical world, features of that world which are *discerned* by the sciences, but which are *explained* by theology of science as hallmarks of the Creator (Oleksowicz, 2020, 758-759; Sierotowicz, 2023, 216-217; Rodzeń, Polak, 2025, 3). Having said that, there are subtle differences in how these studies understand rationality and intelligibility,[1] so I will offer my own view.

In the context of the natural sciences, I will understand rationality to refer to a self-consistent system of reason that we use to interpret our experiences, a scientific theory in other words. And I will understand intelligibility to refer to the conviction that the world itself may be understandable in such terms, the belief that a good scientific theory might provide useful knowledge of the physical world. Notice that intelligibility is value-laden. As Henk De Regt (2020, 40) points out, intelligibility is not an intrinsic property of a scientific theory, but a measure of the degree of confidence placed in it by a group of scientists. Intelligibility is contextual and relational. For example, the Aristotelian geocentric cosmology is a rational system, and was fully intelligible before the Copernican revolution.

1 For instance, Heller (in Sierotowicz, 2023, 216) is quoted as explaining that rationality is a property of the world (by which it can be studied rationally), while Marcacci and Oleksowicz (2023, 12) believe that rationality changes with scientific theory change. This latter view accords with my own.

But as Copernicanism took hold, the Aristotelian cosmology lost its intelligibility, and its rationality became obsolete in scientific terms.

Theology of science establishes why the natural sciences are correct to apply rationality and intelligibility to the physical world. The sciences make many observations consistent with the rationality and intelligibility of the world, but the sciences cannot do otherwise, since they *must* assume the world to be rational and intelligible merely to make their observations in the first place. Therefore, it is an inherent circularity in the scientific method that the rationality and intelligibility of the physical world cannot be established in scientific terms. If we wish to know why the world appears rational and intelligible to us we need another starting point, a *theological* starting point, if not a *theistic* starting point. The early modern scientists – Isaac Newton notably – were convinced that the rationality and intelligibility of the universe reflected the nature of its Creator. Heller himself put it beautifully (1988, 148): "The world is a realization of the rational plan of the Creator; and there is no other way of unravelling the structure of the world except through rational attempts to decipher God's plan." Or, as Marcacci and Oleksowicz (2023, 15) point out in their much more recent theology of science, "the world's intelligibility is a gift given by the Creator to humanity."

The Heller-inspired studies of theology of science are united in this conviction: that the created world is rational and intelligible because it flows from the Creator. The intelligibility of the world is a particular kind of gift. It is a faithful and faith-enriching gift which nevertheless requires faith for it to be grasped as gift.

At this point, the particularity of the gift becomes apparent, since in Christian thought the gift is mediated by God's Son, who, as the incarnate Christ, is himself God's gift to the world (John 3:16). And since the Son has played a role in the creation of the world from the beginning (as the divine Logos of John 1:1-3), he is of particular

interest in theology of science.[2] As Heller (1988, 149) has pointed out, the Logos is the foundation for the rationality and intelligibility of the cosmos. And indeed, this Christological consensus among the Heller-inspired studies – what I refer to here as 'Christological fundamentalism' – is my own starting point in this paper. What has not received as much attention though, are the implications for theology of science of the incarnation of the divine Logos as the human Jesus of Nazareth.

Thankfully, the groundwork was established some time ago, by the Lutheran physicist-theologian, George Murphy. Starting from the cosmic Christology that we have inherited from our scriptural traditions, Murphy points out (1994, 108; 2003, 107) that the divine Logos is not only active in the creation and sustenance of our universe, but he is the source of all possible patterns for all possible universes. And when we consider the incarnation of the Logos, we can see that he must embody the particular physical pattern of this particular universe. Jesus the incarnate Christ embodies our fundamental laws of nature (Murphy, 1994, 110; cf. Heller, 1988, 149). Murphy's interest, like mine, is in the theological dimensions of modern physics: what is the fundamental underneath fundamental physics, that towards which its efforts are (implicitly) directed? It can only be Christ the incarnate Logos. And Murphy argues that cosmic Christology has a direct scientific parallel, namely the intriguing observation that the evolution of our universe appears finely tuned for life and complexity: the anthropic principle. God may appear absent to our modern, secular worldview (Murphy, 1994, 111); at best, we might say that the divine activity is concealed in natural processes, but

2 But it is important to stress that theology of science is equally concerned with the creative activity of the Holy Spirit. After all, the Spirit and Son are the two hands of the Father working in creation (in Irenaeus' memorable image). Likewise, the Spirit, with Christ in his saving death and resurrection, works God's transforming grace among his creatures. In the fulness of time, therefore, theology of science should develop pneumatological concerns to match its current Christological emphasis.

the anthropic principle of finely tuned physical laws and constants has an inescapable theological parallel, "in the belief that the purpose of the universe is the incarnate Logos."[3]

A similar emphasis arises in the idea of deep incarnation. While deep incarnation has become a popular Christological device for addressing ecological concerns and the problem of evolutionary suffering (Edwards, 2019, 1), it also reminds us that the incarnation of Christ has implications for the entire physical cosmos. As one of deep incarnation's foremost proponents, Niels Henrik Gregersen (2013, 375-376), puts it, the incarnate Logos shares the conditions of physical existence, including those described by our most fundamental theories: "From the perspective of deep incarnation, Christ is creatively present at the bottom of the universe, including the strange yet fundamental aspects of physical creation: the intricacies of the indefinitely small and entangled quantum world that forever seems to defy our finite conceptual comprehension."

Gregersen's language is evocative of what I am calling 'Christological fundamentalism:' by holding the incarnate Christ as a fundamental principle, theology of science may provide meaning and purpose for our best physical theories of the fundamental structures of the cosmos, including those of the 'quantum world.' In fact, I propose that the cosmos is intelligible in terms of such theories (even if they might 'defy our finite conceptual comprehension') precisely because they are embodied in the incarnate Logos.

But what are those fundamental physical structures? Gregersen's reference to the 'quantum world' provides the clue for a way forward. In the rest of this paper I explore the relevance of theology of science for that body of theory which many physical scientists believe to be the most fundamental we possess, quantum theory.

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3 Teilhard de Chardin's celebrated idea of Christ as the Omega Point offers a biological parallel.

5. QUANTUM FUNDAMENTALISM[4]

Modern quantum theory enshrines Quantum Mechanics (QM), the mathematical formalism which emerged in the 1920s and 30s in response to new breakthroughs in probing the quantum world. QM continues to be central in quantum science and technology today, and is thereby at the heart of a broad conceptual framework which underpins all natural science. The quantum framework informs our understanding of how matter on the molecular, atomic and sub-atomic scales behaves, while on the macroscopic (human) scale it explains many basic properties of our everyday world and beyond. It is tempting to conclude that QM is at the foundation of physical reality. But a troubling question remains: why is QM so notoriously difficult to interpret?

Everyone knows that QM makes bizarre predictions. Everyday human beliefs – such as that time flows, that there is a difference between cause and effect, between subject and object, that a physical object has properties independently of whether we are watching it – are cast into doubt by QM. Not for nothing is QM widely perceived to be weird, mysterious and counterintuitive.

By the same token, exacting experimental tests invariably confirm the quantum picture; it has never (yet) been proven wrong. As a result, many physicists believe physical reality to be fundamentally quantum, a viewpoint that has come to be known as 'quantum fundamentalism.' Here, everything in the universe is thoroughly quantum, and in principle everything can be described scientifically in such terms.

But despite its widespread acceptance in the physical sciences, quantum fundamentalism can say very little for certain about the physical ontology of our physical world. The empirical science may be astonishingly successful, but it is consistent with a wide variety

4 I have given a fuller account of 'quantum fundamentalism' and its theological implications in Harris (2024b); this section summarises.

of conceptual (metaphysical) interpretations. There are, as a result, many possible quantum ontologies. As quantum fundamentalists we might assume that one of these ontologies is correct, but we do not know which, nor how to judge between them *on scientific grounds*. What is worse, the candidate ontologies contradict and conflict with each other. Many physicists adhere to a form of the Copenhagen interpretation, which is *antirealist* insofar as it emphasises the observer's role in constructing reality. But equally there are fully *realist* interpretations which are equally compatible with the empirical science. Hugh Everett's 'Many Worlds Interpretation' is one such realist interpretation, and it offers an ontology which is totally inconsistent with the Copenhagen view. In Many Worlds, the observer exists in a fully-determined quantum world, but there are simultaneously other quantum worlds which contain the same observer making different observations.

How do we decide between these and other interpretations, if the science cannot help us? Philosophy and theology can make a crucial difference here, as the phenomenon of 'quantum religion' illustrates.

6. QUANTUM RELIGION

Quantum fundamentalism has been a great inspiration to religious thinkers and mystics. Christian theologians have explored it with great ingenuity, finding that the characteristic quantum features of indeterminacy, complementarity and entanglement provide attractive modern analogies for ancient theological enigmas, especially for God's providential relationship with the natural world, and for the ontologies of Christ and of God the Holy Trinity.

Many other religious thinkers – especially those with interests in Hinduism, Buddhism, Confucianism and Daoism – have co-opted quantum physics to support their worldviews, often developing a synthetic 'quantum mysticism' in the process. Similarly, quantum

mysticism has been popular in New Age spirituality, which has in turn inspired developments in contemporary business, lifestyle and coaching practices, not to mention alternative medicine.

It is convenient to gather up these spiritual and theological interpretations of QM into a single movement –'quantum religion'[5] – because, in spite of their diversity, they are all joined by a concern to emphasise the importance of personal mind (or Mind) over impersonal matter. It does not matter that mainstream scientists frequently denounce these interpretations as pseudoscientific: for many enthusiasts of quantum religion, the science appears to be offering an imprimatur for the primacy of subjective conscious experience.

Such is clear from the dominance of the Copenhagen interpretation in quantum religion. In Christian thought, the Copenhagen emphasis on quantum indeterminism is frequently invoked against the determinism of classical physics as evidence that the universe is open to personal, mental and divine causal influences. This argument is by no means watertight (Harris, 2023), but my point in rehearsing it is to illustrate how theological preferences can adjudicate between the different quantum interpretations. Here, the Copenhagen interpretation is favoured by the theology, so that free personal agency may be affirmed over rigid determinism.

Similarly, religious thinkers who adhere to an idealist view of reality – where mind (and Mind) are pre-eminent in determining reality – also tend to align with the Copenhagen interpretation. Its emphasis on the observer's role in determining reality allows such thinkers to argue that *mind* is the decisive factor in the determination of *matter*. Some notable physicists in the early decades of QM adhered to such views. Arthur Eddington (1929, 276-282), for instance, claimed that the basic constitution of the universe is 'Mind-stuff,' while Eugene

5 And here I thank my Oxford colleagues, Pete Jordan, Shaun Henson, and Emily Qureshi-Hurst, for discussions which led to the terminology and shape of 'quantum religion' as a phenomenon.

Wigner (1967) famously claimed that the observer's consciousness is decisive in the appearance of 'reality' in a quantum measurement. And although idealist readings of QM have never been widespread in physics, they are not entirely absent even today (e.g. Stapp, 2011), and they retain sizeable support in quantum religion.

But against these idealist and religious forms of the Copenhagen interpretation stand alternative interpretations of QM which are equally compatible with the empirical science, some of which are resolutely realist. Realist interpretations tend to be popular among philosophers working in the quantum foundations field, but they work with ontologies that conflict strongly with the everyday world of human experience and so have gained little traction in wider culture, nor in quantum religion. Antirealist interpretations, on the other hand, do not present such stark challenges and are more straightforward to grasp on a human level, especially for those religious believers who are predisposed to uphold the pre-eminence of mind and consciousness. The result is that quantum religion tends to favour antirealist over realist interpretations of QM. But what about theology of science? Does it provide further support for the antirealism of quantum religion? I suggest that it does not.

7. CONCLUSION: QUANTUM FUNDAMENTALISM AS CHRISTOLOGICAL FUNDAMENTALISM

My thesis statement in this paper is that, if the physical sciences discern the creative activity of the divine and incarnate Logos then quantum fundamentalism is a form of, and is made possible by, Christological fundamentalism.

This thesis statement might not appear to be very promising at first sight. After all, we have been discussing the rationality and intelligibility of the physical world. And QM remains just as strange – just as unintelligible in common sense terms – as when it was discovered a century ago. "Nobody understands quantum mechanics" claimed

Richard Feynman. The quantum world might be fully rational within the context of the quantum formalism, but this does not necessitate its intelligibility when seen from our everyday human experience. Therefore, QM forces us to consider carefully what we mean when we invoke the intelligibility of nature. Quantum intelligibility is by no means the same as our everyday common sense intelligibility. QM works unerringly well in the quantum world, but when we take one of the realist quantum interpretations and scale its ontology up to the macroscopic human world we are faced with considerable conceptual challenges.[6] Not for nothing do the practitioners of quantum religion prefer antirealist interpretations such as Copenhagen, since its ontological commitments are so sparse compared to the realist alternatives.

But in spite of these conceptual challenges to intelligibility, I suggest that quantum fundamentalism may be rendered intelligible by theology of science. Remember that the theological basis to rationality and intelligibility resides in statements about the creative activity of the Logos: what I referred to earlier as Christological fundamentalism. We can make four further claims about the relationship between quantum fundamentalism and Christological fundamentalism.

First, insofar as quantum fundamentalism is a claim about the fundamental structure of the cosmos it is implicitly reliant on Christological fundamentalism. In the context of scientific fundamentals, theology of science becomes a Christian natural philosophy.

Second, Murphy's version of Christological fundamentalism explained that the pre-incarnate Logos is the source of all possible patterns for all possible universes. In which case, the divine Logos is the source of all quantum interpretations, whether they are antirealist or realist.

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6 The mechanism of decoherence is often invoked to deal pragmatically with the micro- to macro-transition, but even here the conceptual challenges remain.

Third, Christological fundamentalism favours an aspiration towards realism in QM. As Oleksowicz (2020, 758) points out, the created world is God's work, not ours, and for this reason science-engaged theologians (theologians of science, in my parlance) are interested in realism. We might expand Oleksowicz's brief remark in the following way. The created world reflects God's wisdom and goodness entirely and at every level: the world is *real* on its own terms, as a creature of God. There is no possibility that this reality might be determined by a human observer, still less created by such a one. Therefore, in theology of science we are committed to a realist view of what God has made, including in scientific theory (even though we know that scientific theories are always partial and provisional). Theology of science teaches us that the physical world is intelligible as God's gift, and that therefore we can be confident that our best scientific theories are our best conceptions of physical reality. Antirealism in quantum interpretation, on the other hand, shies away from such a claim, not least because it invests the observer with a crucial role in determining reality. But if the created world is the product of God's love and creative insight – if it is God's work alone, and the observer has no part to play in its determination – then I suggest that we should accept the creation in gratitude as theological and scientific realists, in whatever challenging ontology it comes to us. Therefore, Christological fundamentalism commits us to an aspirational realism, which means that we should prioritise realism over antirealism in quantum interpretation.

And fourth, the incarnate Christ – Jesus of Nazareth – embodies the pattern of our own particular universe. In other words, the incarnation of Christ operates as a benchmark for adjudicating between the realist quantum interpretations. Admittedly, it is possible to aspire to 'the spirit of quantum realism' without committing to the challenging ontology of any one realist quantum interpretation (Egg, 2022, 20), but I suggest that we take this current thought experiment in theology of science further and ask which of the realist

interpretations might resonate most strongly with Christological fundamentalism.

There are three main kinds of realist quantum interpretation. Let us take Everett's interpretation first, popularly known as the Many Worlds interpretation. Here, all of reality is represented by the universal wavefunction, and it is continually branching with no collapses. Insofar as each of us is represented within the universal wavefunction we are repeatedly branching into different versions of ourselves at every moment, and each of these versions follows a different future as the wavefunction continues to evolve without collapse. Equally, there are many versions of Christ too, some undergoing crucifixion, we might suppose, others not. If so, the Everett interpretation flatly contradicts the uniqueness of the incarnation and of the Christ event. Another way of putting this is to say that the scandal of particularity is less a scandal for theology of science to resolve,[7] and more a foundational principle that weighs against the Many Worlds interpretation. We cannot affirm the particularity of Jesus of Nazareth if all possible Christs have lived. Christological fundamentalism therefore counts against the Many Worlds Interpretation.

The second kind of realist quantum interpretation is objective-collapse theory.[8] Here, a hypothetical mechanism is introduced which causes the wavefunction to collapse randomly of itself, without Copenhagen's requirement of an external observer to trigger the process; the mechanism thus attempts to resolve the infamous measurement problem while it also avoids Everett's perpetually-branching histories. However, other conceptual problems remain (or are exacerbated), since we must reckon with the primacy of the wavefunction – what kind of object it is or represents – and how it relates to our own

7 The scandal of particularity is, traditionally, the theological question of why the universal and eternal Logos became incarnate in this one human being in one place and time, and thereby achieved the salvation of all, in all places and times.

8 Also known as spontaneous-collapse, or dynamic-collapse theory, or often just 'GRW' (after a well-known version formulated by Ghirardi, Rimini and Weber).

ontology. Taken literally, objective-collapse theory indicates that our familiar three-dimensional existence is not fundamental, but is a projection of the deeper, higher-dimensional reality of the wavefunction. Moreover, the ubiquitous randomness that is built into the wavefunction in this theory raises further ontological questions that go beyond Copenhagen indeterminism. Admittedly, the objective-collapse interpretation introduces fewer problems for Christological fundamentalism than does Everett, but it does not introduce any theological opportunities either.

Not so with the third interpretation – pilot-wave theory[9] – which is potentially generative for Christological fundamentalism. In pilot-wave theory every quantum particle in the universe follows a well-defined trajectory determined by the 'guidance equation', which is itself influenced by the motion of all particles in existence. The interpretation is therefore highly non-local, but also fully *deterministic*. This latter feature has tended to deter theologians, who have almost universally favoured Copenhagen *indeterminism* instead. My own belief is that the determinism of pilot-wave theory is less of a problem for theology of science than might be supposed, but that is beyond the scope of this paper. The main theological opportunity that I want to draw from pilot-wave theory is its pervasive non-locality, which inspired David Bohm (1980) to propose a universal holistic ontology dubbed the 'implicate order.' My point is that a holism (or, at least, a deep universal interconnectivity) is implicit in the doctrine of the cosmic Christ (Bauckham, 2010, 157-158), and is explicit in Deep Incarnation (Simmons, 2021, 357). Whether such deep Christological interconnectivity can be explored in meaningful physical terms such as pilot-wave theory, or whether it should be affirmed along strictly 'spiritual' lines alone (whatever we might understand that to mean) is a moot question. At any rate, articulating the mystery

9 This is a kind of 'hidden-variable' theory which is also often referred to as the de Broglie--Bohm interpretation, after its originators.

of Christ's incarnation in its cosmic context requires us to examine potential physical links between the incarnate Logos and all created entities, including quantum entities. By the same token, Christological considerations allow theology of science to adjudicate between the empirically-indistinguishable quantum interpretations. I suggest that pilot-wave theory is particularly promising in this regard, and I offer it here as a possible option for future Christological work in theology of science.

Let me finish by circling back to my earlier question: What was God thinking when he created the quantum world? We now have an answer: God was thinking of his Son. For Christ is not only the saviour of humankind: as the divine Logos he is also the source and the ground of all matter, of all particles and fields (if Christological fundamentalism and quantum fundamentalism are to be believed). It is Christ who binds all together; our universe is holistic and interconnected in precisely this Christological sense, if no other.

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