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“Not Three Gods; but One” – Why Reductionism Doesn’t Serve Our Theological Discourse¹

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Abstract: The triune nature of God is one of the most complex doctrines of Christianity, and its complexity is further compounded when one considers the incarnation. However, many of the difficulties and paradoxes associated with our idea of the divine arise from our adherence to reductionist ontology. I will argue that in order to move our theological discourse forward, in respect to divine and human nature, a holistic interpretation of our profession of faith is necessary. The challenge of a holistic interpretation is that it questions our ability to make any statement about the genuine, ontological individuation of persons (both divine and human), and in doing so raises the issue of whether we are, ontologically, bound to descend in to a form of pan(en)theism. In order to address the “inevitable” slide in to pan(en)theism I will examine the impact of two forms of holistic interpretation, Boolean and Non-Boolean, on our concept of personhood. Whilst a Boolean interpretation allows for a greater understanding of the relational nature of the Trinity, it is the Non-Boolean interpretation which has greater ontological significance. A Non-Boolean ontology, grounded in our scientific understanding of the nature of the world, shows our quest for individuation rests not in ontological fact but in epistemic need, and that it is our limited epistemology that drives our need to divide that which is ontologically indivisible. Whilst this ontological shift may be necessary, it raises questions about how divine-human relations are to be understood, and I conclude by examining some possible solutions.

Keywords: holism, ontology, individuation, Trinitarian relations

INTRODUCTION

Ayala highlights three main forms of reductionism: methodological, ontological and epistemological²; and although other forms such as causal reductionism have been brought in to our terminology in more recent years, the truth is that, in terms of our theological discourse it is these three that are the most pertinent. Whilst the majority of this paper will focus on the need to move away from ontological reductionism, it is first necessary to understand the methodological advantages to making such a shift. Two of the most central doctrines of the Christian faith - the incarnation and the Trinity are also the most complex, and their complexity stems from the fact that they ask the believer to comprehend something that is both profoundly divided and intrinsically united. Whilst it may be tempting to hide behind the notion of “divine mystery” or echo Wittgenstein and claim ‘whereof one cannot speak thereof one must be silent’³ then we seem to be acceding to the argument, at least implicitly, that the features of God ‘are beyond our reach, then only two possibilities remain: either this “something” [God] is altogether unknowable, and “pure X”, or it is such that we can get, or guess, some knowledge about it, *but merely general or merely allegorical*’⁴. However, such an assumption, even if it is implicit, seems to lead to the ultimate conclusion that ‘the reflective attempt called “theology”, to explicate the religious faith in words, is an altogether mistaken endeavour’⁵. But Christianity doesn’t believe this, it is a faith that proudly and explicitly demarks what it believes through professions of faith and because of this, theologians have set out to try and comprehend how we are to understand division in unity whether that rests in the hypostatic union or the nature of a Triune God. It is in this

¹ This is the final author version submitted to the conference paper series which can be found <http://www.atiner.gr/papers/REL2017-2406.pdf>

² Francisco J. Ayala, ‘Biological Reductionism’, in *Self-Organizing Systems*, ed. by F. Eugene Yates and others, Life Science Monographs (Springer US, 1987), pp. 315–24 (p. 316).

³ Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, trans. by C. K. Ogden, Project Gutenberg eBook (London: Edinburgh University Press, 1922), p. 23 <<https://www.gutenberg.org/files/5740/5740-pdf.pdf>> [accessed 12 October 2015].

⁴ Bernard d’Espagnat, *Veiled Reality: An Analysis of Present-Day Quantum Mechanical Concepts*, Frontiers in Physics, 91 (Boulder, Colo: Westview Press, 2003), p. 355.

⁵ John Macquarrie, *God Talk: Examination of the Language and Logic of Theology*, New impression edition (London: SCM-Canterbury Press Ltd, 1970), p. 24.

space, in trying to wrestle with complex entities, that scientific methodology has found itself firmly engrained into our theological discourse through the use of methodological reductionism.

Methodological reductionism states that 'understanding of a complex system is best sought at the level of the structure and behaviour of its component parts'⁶ and on the surface, this seems like it should be a non-issue, one cannot understand how a watch works by simply looking at it as a whole, one has to understand the parts, so for something as complex as the incarnation, we should start by looking at the parts. The problem with this approach is that in order to understand Jesus as 'Perfect God, and Perfect Man'⁷ we must first be able to explain which characteristics or attributes are necessary and sufficient to make Christ man. We find ourselves beginning by understanding what is "man" and what is "God" and seeing that the two categories appear to be mutually exclusive, which whilst unsurprising, leads us to the second problem of the reductionist methodology for theology. In starting to build our understanding of the incarnation from the ground up, as it were, we tend to find ourselves focusing on the incarnation in isolation from the extended life of the second person of the Trinity - how are we to understand the movement of the immaterial God the Son to the material Jesus Christ or vice versa, or as Leftow phrases it 'how could something relevantly like a soul become something relevantly like a stone?'⁸. The same is true of the Trinity, understanding the roles of the individual persons of the Trinity doesn't help us to understand how we have 'not three Gods: but one God'⁹. Whilst these are explicitly issues of methodology i.e. they arise from trying to understand a complex system at the level of the structure and behaviour of component parts; they also imply a level of ontological reductionism. The ontological reductionism stems from the fact that such methodology brings to the table the belief that the world, and people are divisible into parts, as an unanalyzed *a priori* truth.

THE PROBLEM OF REDUCTIONISM FOR THEOLOGY

I have briefly touched on some of the ontological issues of reductionism for theology, but the issue is best highlighted through consideration of the incarnation, and it is to this that I shall now turn. It is possible to outline eight metaphysical models of the incarnation that explain Christ's humanity and divinity in a way that unites the three concrete objects God the Son (GS), a human body (B), and (possibly) a human soul (S) without falling afoul of heresy. For the purposes of this paper it is enough to note that these models fall in to two broad categories: those that say God the Son became wholly or partially constituted by matter (materialist Christologies) and those in which God the Son became or was constituted by a soul or something 'relevantly like a soul'¹⁰ (dualist Christologies). Whilst it is possible to make finer distinctions the key thing to note is that there are three main issues in dealing with the incarnation in a reductionist ontology: materialism, mind-body interaction and heresy.

Even if one is willing to accept a materialist metaphysics, such as the material monism proposed by Davidson, in respect to human persons, the issue is hugely compounded by the unique nature of the incarnation because the incarnation requires that an immaterial object (pre-existence God the Son) becomes a material object in the incarnation. Such a transformation seems not only impossible to conceptualise, but also to show complete disregard for the principle of Conservation of Mass which states that in a closed system the mass of the system must remain constant over time, as system mass cannot change quantity. If we are to believe that immaterial Christ becomes material, then this would seem to require the creation of a massive amount of matter within a seemingly closed system that is our universe. The problem of a dualist ontology, in which mind and matter are completely separate and distinct substances, is that there is then a question of how or even if it is possible for mind and matter to interact. Just as it seems impossible for something to move from being an immaterial to a material object so it also

⁶ Richard Healey, 'Holism and Nonseparability in Physics', 1999 <<http://seop.illc.uva.nl/entries/physics-holism/#Meta>> [accessed 28 September 2015].

⁷ Quicunque Vult I.32

⁸ Brian Leftow, 'The Humanity of God', in *The Metaphysics of the Incarnation*, ed. by Anna Marmodoro and Jonathan Hill, eBook (Oxford: Oxford University Press, 2011), pp. 20–44 (p. 21).

⁹ Quicunque Vult I.16

¹⁰ Leftow, p. 21.

seems impossible for mind and matter to have a genuinely causal interaction. If such an interaction isn't possible we end up at a Ryleian "ghost in the machine" situation where the mind is causally ineffectual. If the mind and body of ordinary persons are unable to causally interact it seems equally implausible that the immaterial God the Son would be able to interact with a material human body (and has theological implications beyond the incarnation). Finally, it is necessary to establish a metaphysics in which the component parts join together to form one person with two discrete natures. The Incarnate Son of God must be both fully human and fully divine, with two natures that are distinct enough to be separate, but not so separated that Jesus becomes two persons in one body. In trying to understand the incarnation within a reductionist classical framework it becomes very difficult to resolve these problems within the hypostatic union without resorting to an appeal to "divine mystery", in a manner that has distinct echoes of a "god of the Gaps" approach to theology. Not only does such a reductionist account, therefore leave one with some seemingly insurmountable obstacles to forming a coherent account of the incarnation, but it also refuses to acknowledge the fact that 'more than eight decades after the downfall of classical physics, the idea that the physicalist conception of nature, based on the invalidated theory classical physical theory, might be profoundly wrong in way highly relevant'¹¹ to this problem. Whilst this is only a brief survey of some of the issues brought about by reductionism, a more detailed survey of the issue is not possible within this paper, however it does serve to highlight some of the obstacles faced by theologians, due to the entrenched adoption of reductionism.

Most scholars in theology (and science) accept the need for methodological reductionism, and indeed, the reason that methodological reductionism has such a role to play in theology is due to the very fact that we cannot comprehend the complex nature of the incarnation, or Trinity at 'the level of principles governing the behaviour of the whole system'¹² as required by a holistic methodology. However, I contend that the reason that we have such an epistemic barrier to understanding the nature of the whole lies in the entrenched ontological reductionism that sees us isolating characteristics as incompatible. The reason that the immaterial divine become materially human is so counter-intuitive rests in the fact that there doesn't appear to be any connection with regards to the kinds of "thing". Whereas the change of state from water to ice, may seem mysterious to the young child, once the molecular changes are understood it loses its "magic". The change from immaterial to material however, does not seem to have an underlying scientific explanation, there appears to be something deeper taking place and whilst emergentist theories are by far the more popular theory amongst scientists and philosophers alike, they are still based in an assumption of some level of base physicalism, and fail to convert into theistic theology that calls for a creator God. Ontological holism, on the other hand, seems to be able to provide theologian and scientist alike with an ontology that is able to encompass and explain deep paradoxes in both spheres. It also important to note that whilst I will turn to a modern scientific justification for use of holistic ontology in our theology, the idea of a holistic Christianity, at least with regards to persons, is not a new phenomenon. Where I depart from this historical view is to apply a holistic filter to the profession of faith, I will conclude by making some tentative suggestions as to how holism provides us with a new interpretative lens. Before I do so however I shall examine what is meant by ontological holism and suggest that dependent on the holistic model one adopts one either arrives at a deeper understanding of current models of Trinitarian/incarnational relationships or more excitingly a new way of viewing those relationships.

UNDERSTANDING HOLISM

Ontological holism, at its most basic level, states that 'in the last analysis, there is only one independent thing. Everything that exists is a way of being the one thing'¹³. Such a description may be all well and good for the philosopher, but for the theologian who believes God is a genuine part of reality, this sounds perilously close to a

¹¹ Henry P. Stapp, 'Quantum Reality and Mind', in *Quantum Physics of Consciousness*, ed. by Subhash Kak, Roger Penrose, and Stuart Hameroff, EBook (Cambridge, Mass: Cosmology Science Publishers, 2011), pp. 290–470 (l. 297).

¹² Healey, sec. 2.

¹³ Michael Esfeld, 'Philosophical Holism', *UNESCO Encyclopedia of Life Support System, Social Sciences and Humanities* (2013), 1–15 (p. 10) Sec. 5.1.

descent into Spinozism. However, it is possible to augment this initial definition with the popular explanation that a holistic system is "more than the sum of its parts". This combination of there being one fundamental reality, but that the fundamental reality has parts marks holism apart from monism in its ontological standpoint. The notion of "more than the sum of its parts" clearly implies a relational aspect to holism and it is this relational aspect that can be seen to augment our current understanding of Trinitarian relations, a point I shall return to later. However, we are to interpret holism though, it will impact upon how we understand the claim that 'the Word became flesh and made his dwelling among us' (John 1:14), 'since the children have flesh and blood, he too shared in their humanity' (Hebrews 2:14). Holism has once again become important to our theological debate because it has become important to the scientific understanding of the nature of the world. It has come to the forefront of the debate in scientific literature since the discovery of various "paradoxes" associated with quantum theory. Whilst the form of atomism opposed by current science is set out in Newtonian (or classical) physics, and the debate surrounding scientific holism is not limited to quantum theory alone. Traditional attempts at scientific holism focused on how we were to understand space and time in the absence of matter. However classical physics struggles to provide a holistic picture of the world, because it is intrinsically atomistic, if we understand holism as a view that deals with the internal organization of systems then it is no wonder that classical physics falls short, simply because its theory of internal organisation, or basic nature if you will, is a theory predicated on atomism and physical monism. Quantum physics on the other hand is often seen as exhibiting "holistic features [...] in many of the hard problems concerning the ontological foundations of modern physics"¹⁴. The majority of approaches to metaphysical holism can be argued to have a counter-supervenient approach to holism in positing the existence of properties or relations of the whole that do not supervene on the properties or relations of the individual parts.

Having stated that one of the things that sets holism apart from monism is the belief that the holistic system had parts it is necessary to briefly examine what is meant by the "parts" of holistic systems. I believe that "part" as understood in classical physics is not the same as "part" when used in terms of holism. I have said that a holistic system is more than the sum of its parts, but this cannot be the whole story, for it is easy to point to examples of atomistic systems that are more than their parts: a watch is more than the sum of its parts, if you take the watch apart you have the same collection of "parts" you had initially but you no longer have a watch. If you lay a pile of sand out grain by grain in a line across your floor, you no longer have a pile of sand yet you retain the same component parts. Both the watch and the pile of sand are created but the combination of the parts and, crucially the spatial and causal relationships between those parts, however this relational "more than" is not enough to transform either into a holistic system, they remain atomistic systems. The reason for this is that holism requires a more meaningful "more than", the holism is not based in the arrangement but in the *nature* of system's parts, being a part of the holistic system must touch on the *very nature* of the object in question.

BOOLEAN HOLISM

Bearing this in mind it is now necessary to examine holism in more detail. Whilst claiming that ontological holism is necessary for the development of our theological discourse it is important to note that the two forms of holism to be examined provide very different contributions to our theological debate. Boolean holism accepts that the sum is more than its parts, but that crucially the whole does in fact have parts, it developed an intrinsically relational ontology that enables us to deepen our current understanding and look beyond reductionism. Non-Boolean holism, on the other hand, posits something far more radical that in there are no parts, and reductionism is the result of our epistemic limitations and an evolutionary preference for Boolean logic. In order to address the impact both forms of holism may have in moving our dialogue forward, both forms will be explained in detail before being applied to the creedal affirmation.

¹⁴ Andreas Bartels, Holger Lyre and Michael Esfeld, 'Holism in the Philosophy of Physics: An Introduction', *Studies in History and Philosophy of Science Part B: Studies in History and Philosophy of Modern Physics*, 35.4 (2004), 597–99 (p. 597)
<<https://doi.org/10.1016/j.shpsb.2004.09.001>>.

Boolean holism (also known as property holism) maintains that holism is the fact that 'Some objects have properties that are not determined by physical properties of their basic physical parts'¹⁵. This is not a radical statement, there is a long history of emergentist theories regarding the nature of mind, based in a belief that there is something genuine about our experience of a mental life that isn't simply reducible to neuronal firing. The emergentist theories aim to avoid the twin horns of extremism in monism and dualism and plough a middle ground. Emergentist monism (non-reductive physicalism) claims the existence of genuine new properties at levels of higher complexity whilst maintaining that only "matter" as described by physics exists; ontological emergence claims that the new properties arising at higher levels of complexity point to an underlying monistic ontology however this ontology cannot be reduced to the physical alone; finally organicism (pan-experientialism) claims that every real even contain the capacity for experience and consequently a mental aspect. It is worth noting that some pan-experientialists argue that it is impossible for the mental to emerge from the physical and in doing so pan-experientialism stands somewhat apart from the previous two. What all of these interpretations point towards is an understanding of the world in there are properties of complex systems that cannot be adequately explained by reductionism. The question therefore arises in what sense does Boolean holism provide a new avenue for the theologian? Emergentism may work for the philosopher or scientist, but an implication that the only way to explain or understand the existence of an immaterial God is for that immateriality to have arisen from the complexity of the material world is not a theistic explanation. Additionally, the definition of property holism is quite specific, it is dealing with the *physical* properties of *physical* systems, so how can this help us to deal with the immaterial divine? The validity of property holism as a theological tool lies in the argument put forward by Esfeld that 'many of the properties [...] taken to be intrinsic properties of physical systems are in fact relations'¹⁶.

It can be claimed the rise of physicalism lies firmly at the feet of classical physics, Newton built his classical physics on the foundations of Descartes' *res extensa*. *Res extensa*, in terms of contemporary science is 'those aspects of nature we can describe by assigning mathematical properties to space-time points'¹⁷. The laws described by Newton are built entirely on physically describable variables; the causal dynamics of classical physics has no place for the *res cogitans*. Furthermore, in terms of classical physics there is no way to explain the *qualia*-type experiential aspects of our mental life in terms of causal dynamics. With respect to our mental life we appear to have arrived at a point where our thoughts cannot be causally effective, this is because causal laws must be physical laws, and with no physical laws able to describe how the mental can be causal with respect to our physical action, the only option that we appear to be left with (if we want to maintain the belief that our thoughts do indeed control our actions and we are not mere automatons) is that mental events must be physical events. It is this view that has led to emergentist and physicalist positions.

However, if our basic physical properties are in fact relational properties then physicalism points to our fundamental ontology being one of holism rather than reductionism. In order to understand why these may in fact be relational properties we need to return to that atomistic exemplar the watch. As noted earlier we appear to have two very different things with a working watch, and that same watch disassembled - there are properties that are not solely the physical properties of the parts i.e. relational properties. However, it is also possible for the reductionist to argue that what is instantiated in the working watch (over the pile of parts) is not some new physical property but in fact simply an unexpected relation on to which any new behaviour can be placed. Therefore, if physicalism is to remain as being about something more than relations it is necessary to place a limit on the "allowable" or fundamental relationships. The immediate candidate for this limiting factor would seem to be that the only defining relationships of the object are the spatial (or spatiotemporal) relationships. The individual parts can be understood

¹⁵ Healey, sec. 3.

¹⁶ Michael Esfeld, 'Physicalism and Ontological Holism', *Metaphilosophy*, 30 (1999), 319–37 (p. 319).

¹⁷ Stapp, l. 297.

as containing both an 'intrinsic, nonrelational physical state'¹⁸ on to which all the physical properties of the object supervene. Under the reductionist credo it would be possible to reduce these large parts (gears, springs etc.) into a description of the relationship between the physical parts of that gear (for example) this analysis will reach its conclusion once we have arrived at parts that can no longer be divided. In order for the parts of this physical object to longer be divisible they must be unextended points, and so we find ourselves field theory, whereby, under its classical permutation, every point in space has a physical quantity.

Yet it is possible to argue that physics is not ultimately concerned with the physical relational account of the world, but rather that physics is currently concerned with describing, what Esfeld calls the 'functional dependence among physical systems'¹⁹. It is possible to argue that science fundamentally deals with quantities, understood as relational properties. Quantities are understood as relational properties as they allow for scientists to makes comparisons between properties for different systems, for example it is possible to compare dimensions or weight between objects in a way that allows is to set those objects in relation to each other (as longer, heavier etc.). However, whilst it is possible to make relational statements about length or weight, this ability does not imply that the "functions" are in and of themselves relational; to do so would be to conclude that were there a universe containing only one object, that object could not have weight/shape/length etc. Therefore, one cannot claim a move to holism on the basis of rationality alone, or at the very least we must move away from considering relational properties as existing between multiple objects and instead consider relational properties as existing within a single object. It may seem that such a view is presupposing the existence of a holistic ontology however if we return to the unextended points of the watch, it is possible to argue that even classical physics can be seen to point towards a Spinozan unity of matter.

Traditional attempts at scientific holism focused on how we were to understand space and time in the absence of matter, in order to do this, it was necessary to identify matter with space and/or time and in doing so ensure that there was only one thing - matterspace or spacematter. The problem with combining matter and space, in the first instance is that there needs to be a way to distinguish the properties held by individual areas/points of spacematter in such a way that we can create an ontology that is able to explain the properties of ordinary physical objects (both as described in Newtonian physics and common sense). This is because our classical conception of the world revolves around the notion that objects move through space and if objects are space it is difficult to see how this may be possible. Some scholars, such as Bennett, have argued that Spinoza's ontology in fact identified space with matter. Spinoza famously claims that there is only one substance which 'cannot be conceived except as infinite, one and indivisible [...], is conceived by those whom I argue against to be composed of finite parts, and to be multiplex and divisible, in order that they might prove it finite'²⁰. Bennett argues that in setting his single substance as infinite and indivisible Spinoza is equating substance with space (whether this is the correct or only interpretation of Spinoza's metaphysics is beyond the scope of this paper). If we adopt this interpretation it is clear to see how classical physics (whilst atomistic) can allow for an unexpected level of holism. Whilst it is possible to arbitrarily divide space into regions (i.e. we can make division within it) we cannot make divisions of it because it is infinitely extended 'it cannot be split from side to side, because [...] it has no sides, and it cannot have pieces taken away from it because there is nowhere for them to go'²¹. For Spinoza when we ascribe properties to a certain "object" what we are actually doing is ascribing them to a certain region of space and saying that that region of space is "pebbly", or "watery". There are no additional *physical* systems in addition to space, rather an objects' properties are realised as properties of a region of space, but the properties of the region of space are not identical to the properties of the body localized there.

¹⁸ Tim Maudlin, 'Part and Whole in Quantum Mechanics', in *Interpreting Bodies: Classical and Quantum Objects in Modern Physics*, ed. by Elena Castellani (Princeton, NJ: Princeton University Press, 1998), pp. 46–60 (p. 48).

¹⁹ Esfeld, 'Physicalism and Ontological Holism', p. 320.

²⁰ Benedictus de Spinoza, *Ethics* (Ware: Wordsworth Editions, 2001) (1p15s).

²¹ Jonathan Bennett, 'Spinoza's Metaphysics', in *The Cambridge Companion to Spinoza*, PDF Extract (Cambridge : New York: Cambridge University Press, 1996), pp. 61–88 (p. 4) <<http://www.earlymoderntexts.com/assets/jfb/spinmet.pdf>>.

The reason that Spinozan metaphysics posits a kind of holism that is relevant to our discussion of Boolean holism (and indeed reductionism) is because for Spinoza space is matter, and more crucially (classical) three-dimensional space is a continuum and this makes it inherently relational. In order for a point of space to exist there must be other points of space also in existence (it's a continuum), as Esfeld notes 'what makes something a point or a region of space is relational properties or relations to other points or regions within the whole of space'²². What this means for a holistic ontology is that whilst the properties may be properties of the whole (of space) they actually refer to the internal structure of that whole. This isn't to imply that space exemplifies two different properties simpliciter rather (i.e. that is both pebbly and watery) but rather that at point x it has the property of being pebbly and at point y it has the property of being watery - whilst it is possible to say that space as a whole has these properties what the properties actually do is define different points or regions within that one space. It may seem that this descent into Spinozism has erred off topic but in fact the notion of space and space points forming a continuum is very much at the heart of why ontological reductionism fails when taken to its extreme. Taken to its extreme reductionism leads to some form of field theory - the idea that space is made up of an infinite number of space(-time) points all standing in relation to one another, this is because until an object is reduced to an unextended point it can still be reduced further. However, if we fully accept a form of field theory in which every region of space 'is specified by the attribution of a physical quantity'²³ it would appear that we have arrived a potentially a truly radical holism in which no portion of space(time) can be described without reference to every other portion of space(time) i.e. the entirety of the universe. This is a far cry from the aims of reductionism and yet it appears that taken to its full conclusion reductionism leads to a form of Boolean holism.

NON-BOOLEAN HOLISM

Whereas Boolean holism examines the relationships between the parts of the system, Non-Boolean holism examines the very system itself. In *Non-Boolean Descriptions for Mind-Matter Problems*²⁴ Primas sets out a 'framework for the mind-matter problem in a holistic universe which has no parts'²⁵. He claims our current understanding of mind-matter is based on a tacit acceptance of classical atomism and, as I have already noted with respect to the incarnation, this assumption of the correctness of a reductionist model of reality has serious knock-on implications for our understanding of the issues concerned. Primas bases his need for Non-Boolean descriptions in the fact that quantum mechanics has shown atomism to be incorrect thus causing reductionism to fail. Therefore, instead of being the fundamental building blocks of reality "elementary particles" should in fact be more correctly understood as secondary manifestations or '*patterns*'²⁶ in reality. These patterns are to be understood as arising from our contextually based decomposition of the 'fundamentally holistic universe of discourse'²⁷ when we 'isolate a phenomenon and assign individuality to it'²⁸ (creation of a pattern) and not from an underlying ontological atomism. At this level of description non-Boolean holism sounds very similar to Spinozan metaphysics - after all for Spinoza all matter is the same 'except in as far as we regard it as affected in different ways, parts are not distinguished in it; that is to say, they are distinguished with regard to mode, but not with regard to reality'²⁹. The difference with a non-Boolean description of the world as proposed by Primas, is that it does not rely on Spinoza's argument that 'in nature there cannot be two or more substances of the same nature or attribute'³⁰. Instead Primas examines the world described by quantum physics and the way in which classical (Boolean) descriptions fail to adequately account for the quantum world. Classically Boolean classifications are made on the basis of shared attributes of individual objects, on the assumption that both individual objects exist and that they have *well defined*

²² Esfeld, 'Physicalism and Ontological Holism', p. 323.

²³ Maudlin, p. 48.

²⁴ Hans Primas, 'Non-Boolean Descriptions for Mind-Matter Problems', *Mind and Matter*, 5.1 (2007), 7–44.

²⁵ Primas, p. 7.

²⁶ Primas, p. 8.

²⁷ Primas, p. 8.

²⁸ Primas, pp. 11–12.

²⁹ Spinoza (1p15s).

³⁰ Spinoza (1p5).

attributes. Whilst none of these classifications are unbiased, they can all be described in terms of Boolean logic and they can be understood to be compatible or incompatible with one another depending on whether they can be encompassed within a single common Boolean classification. The crucial point to made here is that whilst it is possible to combine some compatible classifications into a single Boolean description what it is most assuredly not possible to do is to combine the totality of all experiments, or classifications, into a single Boolean description.

Boolean classification allows for the description of the world in terms of duality, whereas non-Boolean classification allows for the description of the world in terms of complementarity. The greatest example of the difference between these description lies in the concept of wave-particle duality. When understood as a duality it allows for the fact that photons exhibit properties of waves and particles, in other words, waves and particles fall into separate Boolean categories. The problem with this description is that we now know that whilst they can be wave-like and/or particle-like photons can also exhibit an infinite number of other states that don't fall in to the two discrete categories. Because the description is not one of "well defined" attributes we were wrong to class it as a duality and should instead be classing it as complementarity. To say that the statement is complementary rather than dualistic is to claim that it describes a holistic situation 'where Boolean fragmentation into parts is not possible'³¹. Complementarity allows us to describe a world which Boolean classification does not work, at the ontological level, it acknowledges the fact that whilst it is in principle possible to know everything about the conditions of a particular experiment or a particular region of space, what it is not possible to do is to know everything simultaneously. This may sound like an extremely flippant statement, of course we cannot know everything at once we are not omnipotent; but this claim isn't about omnipotence it's a claim about the evidence it is possible to collect in a single experiment. For example, whilst it may be in principle possible to measure both the location and the momentum of a particle it is not, according to Heisenberg's Uncertainty Principle, possible to know both at the same time. What this means is that our discourse, whether theological or scientific, needs to be expanded to allow for complementary descriptions and that in doing so we need to actively acknowledge that the complementary description 'refers always to a contextually chosen decomposition of the universe of discourse'³², it is not describing an ontological state of affairs.

Perhaps the best example of the effect of moving towards a non-Boolean holistic account of the world lies in the implications for the "paradox" of entanglement. Given that entanglement is often cited as a useful analogy for Trinitarian relations it starts to provide and insight in to the potential theological implications of adopting a holistic ontology. In our everyday understanding of the world we believe that certain objects are independent of one another - that there exists an ontological separation through time and/or space. We understand two objects to be "separate" if an experiment performed one does not impact upon the state of the other, and in viewing separability as something self-evident in nature the curious effects of experiments on "entangled" objects provide us with a paradox. The earlier description of property holism spoke of the physical properties of physical systems however in a genuinely holistic world where physical and mental are not ontological distinctions 'genuine holistic correlations are not restricted to physical systems'³³ because the description of the world is not based in an atomistic world full of parts the correlations are in fact no more than a contextual concept rather than an ontological anomaly. This is because a system that is genuinely describable through Boolean logic does not create "entanglement", "entanglement" is created when a Non-Boolean system is divided into parts, furthermore the level of entanglement is subject to change depending on how the system is partitioned.

What a Non-Boolean ontology leaves us with therefore, is the need to recognise that out partitioning of the world, just like our decisions about what is "irrelevant" for any one experiment, are not based in natural laws, or genuine features of nature but in a human decision or bias. They are based in the limitations of our measuring equipment

³¹ Primas, p. 15.

³² Primas, p. 16.

³³ Primas, p. 28.

and the information that we wish to portray. That is not to say that our *language* does not still have a place for Boolean descriptions, but that when we speak in Boolean terms we have to acknowledge that we are not speaking about the way the world is, but about a particular experiment, region of space, or object in *isolation*. What it is possible to do, however is to combine multiple Boolean descriptions in such a way that they overlap in order to provide us with a partially Boolean description. For example, different cartographic projections provide us with a different Boolean representation of the world. They are able to preserve some but not all of the details in isolation. the Mercator projection preserves angles and circles and is used in aeronautical charts, but presents the world as a flat surface; the stereographic projection preserves shapes and directions and is used in the polar regions, however area becomes more distorted the further from the centre of the circle one moves; the Lambert azimuthal projection preserves areas but the further one moves from the centre of the map the greater the distortion of shape. When taken in isolation, each projection has sacrificed that which is deemed irrelevant for its purposes, and none is able to provide a fully accurate representation of the way the world *actually* is. Yet, if all of these projections are combined, pasted together as it were, they would enable us to see the totality of the information available to us.

Just as it is possible to combine multiple projections to provide a global picture in the case of the maps, it is also possible to do the same with our Boolean descriptions of the nature of the world – we need to create what is called as *Boolean atlas*. A Boolean atlas is formed of families of Boolean descriptions called Boolean charts. These charts then overlap in such a way that when they overlap they are compatible. The combined information contained within a Boolean atlas is able to provide all the information required for a non-Boolean description. Where the Boolean charts overlap they will appear to *locally Boolean* even though taken as a whole they are *globally non-Boolean*. These locally compatible areas of the Boolean atlas can be defined through partial Boolean descriptions in which the overlapping elements can be said to have a common Boolean sub-description. However not every pair of elements within the overlapping collection will belong to the same sub-description. What this breaks down to is the fact that even when there is a local overlapping the overlapping itself cannot be quantified in a single Boolean description rather there is complementarity involved at the local level meaning that not all of the descriptions will apply to all of the pairs. Whilst it is possible to examine the details of why quantum physics points toward a holistic ontology, an in-depth study goes beyond the scope of this paper³⁴. Therefore, with the caveat of it being one interpretation amongst many, the remainder of this paper will assume a holistic ontology and in doing so proceed to examine its impact on our understanding of the creeds.

MOVING TOWARDS A HOLISTIC THEOLOGY

In moving towards a holistic theology there are two things that need to be considered: our methodology and our ontology. This paper focuses on the move towards a holistic ontology – whilst this needs to be undertaken alongside a methodological shift it is not necessary presuppose any particular methodological approach to see the change to our discourse if we adopt a holistic ontology. The notion of a holistic Christian theology is not new, at least in terms of understanding human persons. There is a general consensus amongst contemporary Old Testament scholars that Hebrew anthropology was decidedly holistic; ‘in fact, body, soul, and spirit do not refer to mere parts at all, but in different ways connote the whole human person’³⁵. These “parts” of the person are so united that if any part were destroyed the person would cease to exist. This kind of thought is in sharp contrast to the Greek influenced texts in which the possibility of surviving death requires some form of dualism (whether or not this is Platonic). Whilst it is possible to argue for a dualist understanding of persons based in the texts of the New Testament it has been argued that the move from holistic to dualistic conceptions of personhood resides in the expansion of Christianity and the subsequent movement from Hebraic to Hellenistic thought in the early centuries of Christianity.

³⁴ for a detailed explanation of Non-Boolean ontology I direct the interested reader to Primas, secs 4 & 5; for an accessible explanation on why quantum theory posits incompatible Boolean descriptions (i.e. there descriptions are dependent on the order of the filters) see lecture 1 in Leonard Susskind and Art Friedman, *Quantum Mechanics: The Theoretical Minimum* (New York: Basic Civitas Books, 2014).

³⁵ John W. Cooper, *Body, Soul, and Life Everlasting: Biblical Anthropology and the Monism-Dualism Debate* (Grand Rapids, Mich: Eerdmans, 2000), p. 35.

That reductionism has become so entrenched in our theological discourse stems from Newtonian physics, and yet the church has not been half as quick to adopt the holistic ontology proposed by quantum physics, except to use a dualistic interpretation as an analogy. Part of the reason for this lies in the complexity of quantum physics, part lies in the fact that there is no standardised interpretation of the findings, or agreement as to whether the findings actually tell us about the nature of the world (realist interpretations) or simply about statistics (statistical interpretations). It also in part lies in the fact that there is a tendency to think that our understanding of the creaturely domain cannot tell us anything about the divine realm and therefore it is pointless to attempt any form of doctrinal approach to the relationship between science and religion. The truth is that these are legitimate concerns and need to be addressed if the move to holistic theology is to be taken seriously.

There is no doubt that quantum physics is a complex and unwieldy beast, describing things that are far beyond the level of our senses and leaving us unable to arrive at an intuitive grasp of its subject matter. When this is combined with the fact that the only way for us to comprehend the quantum world is by 'rewiring our intuitions with abstract mathematics'³⁶, we arrive at a worldview that is both unimaginable and incomprehensible to the majority. Gone is Newton's easily imagined world of microscopic billiard balls, and instead we are left with chance, indeterminism and particles that may or may not be able to be given a fixed location in space. When described in these terms it is no wonder that quantum physics has yet to usurp the Newtonian view on the collective imagination. However Christian theology asks us to imagine a creator God, a God so vast and limitless that He cannot be contained, yet for all His vastness cannot be physically located. It asks us to imagine that a discrete part of this God which isn't itself a separate God, but is a separate person (however we are to understand persons when being with beings so totally opposite to ourselves) became physically man like us and walked this earth to bring us redemption for our sins, yet at the same time was weak and fallible like us. It asks us to imagine to a greater or lesser extent the presence of Christ in the Eucharist, each and every Eucharist; equally, no matter how many are taking place at any one time – if that kind of transcendence doesn't raise questions about spatial locality, I'm unsure what will. Both quantum physics and Christian theology ask us to conceive of the inconceivable, they both have a unique language that can be unintelligible to those outside, and neither can provide fundamental empirical truths about their existence.

This is not to say that all should be left to analogy, nor is it a defense against those who will argue that science can provide a more cumulative proof than Christianity's eschatology. But it is to argue that complexity should not be a barrier to engagement. Interdisciplinary research is on the rise, we are all expected to be contributing not just to our own field of research but to make links across and beyond our disciplines. Yet in doing so there has to be an acknowledgement that we cannot all be masters of "everything the light touches", just as we would accept the voice of an expert within our field, without returning to reprove their proofs, so I believe, it is perfectly acceptable to say that quantum physicists know what they are saying when it come to what quantum physics tells us about the world. This is not deny that there are disagreements (I will return to this shortly), nor to say that they definitively have the correct answers. But it is to say that as long as the assumption is acknowledged at the outset, to assume that a particular metaphysics suggested by quantum physics is valid, holds no less academic rigor than to assume an epiphenomenalist perspective, or an anti-realist perspective. Whilst this may leave the argument open to being denied at the outset by those who disagree with the premise, it does not make the subsequent argument false.

Adopting such an approach allows theologians to actively engage with the scientific metaphysics without expecting the theologian to prove why the metaphysics is valid. This is not to openly endorse a doctrinal approach to science and religion, but it allows theological discussion to take on board the scientific ontology, examine how it may impact current understanding, and engage in constructive discussion. Whilst still acknowledging that that particular metaphysics may be proven wrong.

³⁶ Susskind and Friedman, p. xix.

The second reason that quantum physics hasn't simply taken the place of Newtonian physics, in our theological discourse, rests in the disagreements amongst the scientific community as to the "correct" interpretation of quantum physics. Part of the reason that a doctrinal approach to religion and science (with respect to quantum physics) doesn't work, is due to the speculative nature of quantum physics, there is currently no empirical way to determine which, if any, of the existing interpretations is "correct". The current interpretations vary from stating that quantum mechanics offers a genuine description of reality, to those that argue it simply describes a collection of similarly prepared systems or event that it simply works for all practical purposes (FAPP) and therefore there is no need to look for any deeper metaphysical understanding. The debate about the variety of interpretations of quantum physics is itself part of a larger debate as to whether science ever genuinely says anything about the nature of the world, with scientific realism holding that 'both observable and unobservable aspects of the world described by the sciences'³⁷ genuinely exist.

If one holds with McGrath³⁸, that Christian theology and the natural sciences seek to describe the same objective reality, and furthermore that both being *a posteriori* disciplines, they arrive at knowledge of that reality in the same manner, then it would appear that the metaphysics provided by quantum science is highly relevant to our theological debate. Whilst this does not serve to override the lack of empirical evidence in favour of one interpretation over the other, what it does is highlight the fact that the scientific worldview can and should contribute to our theological discourse. With each of the realist interpretations providing their own set of baggage and assumptions, and the lack of an objective measure for differentiation, the reasons for choosing one interpretation over another, for the theologian and the scientist are subjective.

CONCLUSION

APPENDIX

ACKNOWLEDGMENT

REFERENCES

³⁷ Anjan Chakravartty, 'Scientific Realism', in *The Stanford Encyclopedia of Philosophy*, ed. by Edward N. Zalta, Fall 2015, 2015 <<http://plato.stanford.edu/archives/fall2015/entries/scientific-realism/>> [accessed 7 November 2016].

³⁸ Alister E. McGrath, *A Scientific Theology: Nature: 1* (Grand Rapids, Mich: William B Eerdmans Publishing Co, 2001); Alister E. McGrath, *A Scientific Theology: Reality v.2: Reality Vol 2* (Edinburgh; New York: Continuum International Publishing Group Ltd., 2002); Alister E. McGrath, *A Scientific Theology: Theory: Volume 3: Theory v. 3*, New edition edition (London: T & T Clark International, 2011).