Is Open Theism's Cosmology Coherent?

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1. Introduction

For centuries, classical theism has held that God does not exist within time, but is outside of time. A new theology, open theism, now argues that God exists within time. Open theists further argue that a temporal God cannot foresee the outcome of truly indeterminate future events. By entering time, God has chosen to limit God's omniscience.

At the same time, developments in physics during the past century, particularly in the areas of special relativity, quantum mechanics and complexity theory, have much to say regarding the nature of time and the indeterminacy of future events. We are seeing an opportunity to use these scientific theories to shed light on theological questions. The purpose of this paper is to explore whether special relativity, quantum mechanics or complexity theory conflicts with open theism's view of divine time and omniscience. These areas of physics can help us determine whether open theism's cosmology is coherent.

My thesis is that it is. I will not argue that physics is able to prove the truth of a temporal God or a limited omniscience, but merely that it does not conflict with, and is in fact supportive of, this cosmology. However, the science is not determinative. Until physics is able to provide more answers regarding time and uncertainty, the debate regarding God's temporality will have to continue on theological grounds alone.

The questions of God-in-time and God's omniscience are important theological questions because of their implications for divine providence and human agency. Open theism's proposition that God cannot foresee the outcome of all future events directly conflicts with predestination, a cornerstone of Calvinist theology. It also implies that we

are truly free to cooperate with God's will for the world, or to work against it. If open theism is coherent, then its implications for the theology of providence and free will cannot be dismissed.

First I will outline the views of classical and open theism regarding God's temporality and omniscience. I will then examine the implications of special relativity, quantum mechanics and complexity theory for divine time, omniscience, and providence in turn.

Outline

2. Exposition

2.1. Classical Theism

Augustine, followed by Boethius, Anselm and Aquinas, developed the classical view that God exists outside of time, and is not subject to the passage of time[1]. God has direct access to all of time, from the beginning of the universe until its end. Time, like space, is a creation of God, and therefore God must be independent of time.

The Bible frequently refers to God as "everlasting", or lasting for eternity (e.g. Psalms 93:2). Classical theism asserts that these descriptions of God should be

[1] Brent Bartz, *The Relationship Between God And Time: Is Divine Eternity Atemporal Or Temporal?* (Portland, OR: Theological Research Exchange Network (TREN), 2005) pp. 49-51

interpreted as "timeless" instead of as "forever"[2]. The Bible's frequent depictions of God acting at specific times and experiencing time as we do are interpreted as anthropomorphic understandings of God's actions. Being in time themselves, the biblical authors perceived God's actions as occurring in time. However, this perception does not reflect an accurate ontological representation of God.

Because God is outside of time and therefore able to timelessly access all of time, God's omniscience is perfect. There is no personal experience of time for God, so all times are equally Now. God already knows the decisions we will make, and their outcomes. And not just for us, but for all people in all times.

Since God does not experience the passage of time, God is timelessly active from the beginning of time to its end in a single creative act. The dividing line between creation and providence is therefore somewhat blurred. All times participate in both God's creation and God's providential preservation of creation.

2.2. Open Theism

Open theism is a contemporary theology developed by Clark Pinnock, John Sanders, Gregory Boyd and others[3]. Open theists begin by pointing out that the Bible continually refers to God as involved within time.

> *Of course, God existed before the world, endures in a way that the world does not and is everlasting, but he still relates to us from within the structures of time. God is described as making plans and carrying them out (Jer. 18:11, 29:11). There is temporal succession in God's thinking; he remembers the past, interacts with the present and anticipates the future. There are temporal gaps between what God plans and when he achieves the goal. The past is past and God remembers it; the future is future and God anticipates it. God is not thought of in terms of*

[2] Bartz, *The Relationship Between God And Time: Is Divine Eternity Atemporal Or Temporal?* pp. 58-61
[3] My description of open theism is largely drawn from Clark Pinnock, *Most Moved Mover: A Theology of God's Openness* (London: Paternoster Press, 2001)

> *timelessness, whatever that means. At least since creation, the divine life has been temporally ordered. God is inside not outside time.*[4]

Open theists take the Bible's references to God as "everlasting" at face value. While God is in time, God is also infinite and will have no end. While there are similarities with process theology, open theism does not deny God's transcendence or existence independent from creation. Open theism reasserts God's immanence without denying God's transcendence. God is a person in relationship with the world. As such, God must be in time, because to be a person in relationship means to participate temporally[5].

God has chosen to limit Godself to allow humans libertarian freedom[6]. Through God's gift of free will, our decisions are truly indeterminate. Since God is in time, even God cannot know what has not yet been determined. In an ontological sense, the future is partly settled, and partly unsettled[7]. God's omniscience is still complete however in the sense that "God knows everything that can be known"[8].

Open theism has implications for creation and providence as well. God's creative act did not create the universe in one act from the beginning of time to the end of time, but God's creative act was in time. "In the beginning", God created the universe. Since creation, God experiences the flow of time just as we do. Providence, then, is God's action within time. God preserves the universe from within each successive moment in the universal Now.

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[4]Pinnock, *Most Moved Mover*, p. 32.
[5]J. C. Lucas, "The Temporality of God," in Robert John Russell, Nancey Murphy and C. J. Isham eds. *Quantum Cosmology and the Laws of Nature: Scientific Perspectives on Action* (Vatican City: The Vatican Observatory, 1993) pg 235
[6]Pinnock, *Most Moved Mover*, p. 127
[7]Pinnock, *Most Moved Mover*, p. 47
[8] Pinnock, *Most Moved Mover*, p. 138

3. Critical Analysis

3.1. Divine Time

Some contemporary physicists echo Augustine's view of the nature of time, proposing the "block universe" model. This view assumes a *static* model of time, in that time does not truly flow from moment to moment, but all times exist equally. In the words of physicist Julian Barbour, "Julius Caesar is still alive"[9]. Dan Falk explains that "'[n]ow' […] is reduced to a subjective label, just like 'here'"[10]. The flow of time is merely a psychological phenomenon, a trick our mind plays on us[11]. This view of time is based on two developments in physics in the 20th century. First, Einstein's Special Theory of Relativity demonstrated that "simultaneity" is a subjective concept that varies depending on the reference frame of the observer[12]. Even the observed rate of the passage of time itself varies with respect to the reference frames of the observer and the clock being observed. Time is merely a fourth dimension in a four dimensional space-time continuum. Relativity seems to dispute the concept of a universal Now in which God is present. Since all reference frames are relative and none is preferable, there cannot be an absolute time in which God is present.

However, this is a misuse of relativity. While different observers might disagree when an event occurred, they will all agree that the event happened in the past. Different reference frames would only lead to disagreements on the sequence of past events, not

[9]Julian Barbour as quoted by Dan Falk, Scientific American podcast transcript, http://www.scientificamerican.com/podcast/episode.cfm?id=in-search-of-time-09-03-19 , accessed November 20, 2009.
[10]Dan Falk, *In Search of Time: The Science of a Curious Dimension*, (New York, NY: Thomas Dunne Books, 2008), p. 4
[11]Falk, *In Search of Time: The Science of a Curious Dimension*, p. 4
[12]A "reference frame" specifies the motion of an observer.

whether they have already occurred[13]. There is no reference frame that would allow God, within time, to observe an event earlier than an observer proximate to the event and in the event's reference frame. An omnipresent God would be present in every reference frame and so would be aware of an absolute Now[14].

The second important development in physics in the 20th century, quantum mechanics, explains the behavior of the smallest particles of matter. While quantum mechanics will have other implications for us later, of concern to us now is that it shows no "arrow of time". Quantum mechanics shows no preference for events occurring forward in time vs. backwards in time. There is parity with respect to the direction of time that challenges the objectivity of our perception of the flow of time.

While quantum mechanics does not support the directionality of time, thermodynamics does. Subatomic particles may have no preference for going forward or backward in time, but tea cups do. A tea cup falling off a table and shattering on the floor is not surprising, but a shattered tea cup reassembling itself and jumping back onto the table would be[15]! This is the result of the thermodynamic arrow of time. Unlike quantum mechanics, thermodynamics is compatible with a *dynamic* model of time in which there is an objective Now separating the determined past from the undetermined future.

It is presumed that our psychological perception of the flow of time is a result of the thermodynamic arrow of time, although this relationship has not been proven.

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[13]Lucas, "The Temporality of God," in Russell et al eds. *Quantum Cosmology and the Laws of Nature: Scientific Perspectives on Action,* p. 239

[14]For an alternative view, see C. J. Isham and J. C. Polkinghorne, "The Debate Over the Block Universe," in Robert John Russell, Nancey Murphy and C. J. Isham eds. *Quantum Cosmology and the Laws of Nature: Scientific Perspectives on Divine Action* (Vatican City: The Vatican Observatory, 1993), p. 140

[15]John Polkinghorne, "Time in Physics and Theology," in Harry Lee Poe and J. Stanley Mattson eds. *What God Knows: Time, Eternity, And Divine Knowledge* (Waco, TX: Baylor University Press, c2005), p. 65

Similarly, physicists are unable to reconcile the lack of an arrow of time at the quantum level with the arrow of time at the thermodynamic level[16].

John Polkinghorne's reply to this lack of directionality to time in quantum physics is "so much the worse for physics!"[17] The inability to reconcile quantum mechanics' absence of temporal directionality and thermodynamics' presence of the same is no reason to conclude that there is no directionality. While there currently is no scientific proof of a dynamic model of time, there also is no proof for a static model. Physics may have more to say on temporal directionality and dynamics in the future, but in the meantime, a temporal God cannot be ruled out. We must conclude then that science cannot now dispute open theism's theology of God within time.

3.2. Omniscience

Contemporary physics also makes several observations that support the view of a contingent future. Notably, quantum mechanics has destroyed the deterministic universe of Newtonian mechanics. Laplace famously postulated a calculating demon that, if it knew the position and velocity of every particle in the universe at a point in time, could predict the future and retrodict the past from Newton's Laws of Motion[18].

Heisenberg's Uncertainty Principle destroys this Laplacian view by introducing uncertainty in the properties of the smallest particles of matter. While it is possible to predict at a gross level how long it will take for half of the atoms in a piece of radioactive

[16]Isham and Polkinghorne, "The Debate Over the Block Universe," in Russell et al eds. *Quantum Cosmology and the Laws of Nature: Scientific Perspectives on Divine Action*, p. 138
[17]John Polkinghorne, *Exploring Reality: The Intertwining of Science and Religion* (Yale University Press, 2005), p. 116
[18]John Polkinghorne, "Time in Physics and Theology," in Poe et al eds. *What God Knows: Time, Eternity, And Divine Knowledge*, p. 68

uranium to decay, it is impossible to determine when a particular uranium atom will do so. The subatomic world is ruled by probabilities, not certainties.

Whether the indeterminacy of quantum mechanics proves open theism's belief that God's omniscience is limited by as-yet undetermined contingent events depends upon the underlying causality of quantum indeterminacy. There are three possibilities, as Ian Barbour explains[19]:

1. *Uncertainty may be attributed to* temporary human ignorance. *Exact laws will eventually be discovered.*
2. *Uncertainty may be attributed to* inherent experimental or conceptual limitations. *The atom in itself is forever inaccessible to us.*
3. *Uncertainty may be attributed to* indeterminacy in nature. *There are alternative potentialities in the atomic world.*

Most physicists lean towards the third explanation, although the rationale is philosophical, not scientific: "epistemology models ontology"[20]. If this is true, then God within time would not know the outcome of quantum events until they occur. On the other hand, if either of the first two explanations turns out to be correct, God would have full knowledge of the outcome of future quantum events. Open theism's view of God's omniscience may yet be proven or disproven by future scientific insights into the source of quantum uncertainty, but open theism does not currently conflict with our scientific understanding.

A second source of uncertainty in the world, complexity theory, has challenged the scientific paradigm of reductionism. Again, Laplacian determinism assumes that any behavior of a system can be fully predicted by the behavior of its constituent elements.

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[19]Ian Barbour, Religion *in an Age of Science: The Gifford Lectures 1989-1991 Volume 1* (New York, NY: HarperCollins, 1990), p. 101. Emphasis in the original.
[20]Isham and Polkinghorne, "The Debate Over the Block Universe," in Russell et al eds. *Quantum Cosmology and the Laws of Nature: Scientific Perspectives on Divine Action,* p. 139

So the behavior of a human brain can be predicted by studying the behavior of its neurons, which can be predicted by studying the behavior of its constituent biochemistry, which can ultimately be explained by studying the fundamental particles of which its chemistry is composed.

However, complexity theory has demonstrated that complex systems exhibit behaviors that are impossible to predict through reductionism. Systems such as the earth's weather, human societies, or our brains display emergent organization and structures. This emergent behavior at higher levels of organization directly affects the behavior of the constituents at lower levels of organization. This complexity introduces self-direction into complex systems that is not deterministic[21]. If indeterminacy resulting from non-reductionist complexity in human brains is the mechanism that leads to free will, then if we remove the indeterminacy, we remove the free will. This supports the incompatibilist position regarding free will and divine control. Open theists argue that a free choice is only free if it is not predetermined by God. I am only free if I am free to make any choice[22], hence free will is incompatible with a closed future. The evidence for fundamental uncertainty in the brain lends credence to this view.

Open theism's belief in God's inability to foresee events that have not yet been determined can be accounted for by the uncertainty of complex systems, in concert with quantum uncertainty. This need not be a limitation of God's omnipotence, but a freely chosen self-limitation by God to kenotically create a universe where such uncertainty

[21]Nancey Murphy, *Bodies and Souls, or Spirited Bodies?* (New York, NY: Cambridge University Press, 2006), p. 107

[22]William P. Alston, "Divine Action, Human Freedom, and the Laws of Nature," in Robert John Russell, Nancey Murphy and C. J. Isham eds. *Quantum Cosmology and the Laws of Nature: Scientific Perspectives on Divine Action* (Vatican City: The Vatican Observatory, 1993), p. 191; also Pinnock, *Most Moved Mover*, p. 127

exists for God's own purposes[23]. To assert that God is omnipotent does not require that God fully exercise God's omnipotence. In an attempt to defend God's omnipotence, we cannot limit God's sovereignty to exercise God's power as God wills.

3.3. Providence

Open theism conflicts with Calvinism's theology of predestination, the view that all things have been foreordained by the sovereign God. Because God freely chooses self-limitation, God decides not to predestine all events as is God's sovereign right. God has made this choice so that we may freely choose to love God, because true love cannot be compelled[24].

Polkinghorne uses a metaphor of "God as the Grand Master of cosmic chess, responding to, but never baffled by, the moves of his creaturely 'opponent', and so sure to deliver eventual checkmate as the game unfolds" to describe open theism's theology of providence[25]. God does not control every event, but guides the world to bring about God's will without impinging on our libertarian freedom. In this way, open theism does not preclude the inevitability of the arrival of the eschaton. God's providential governance will lead history to the eschaton, but within the uncertainty imposed by human free will.

4. Conclusion

Open theism's theology of a temporal God and God's self-limiting omniscience is internally consistent and not in conflict with the current state of scientific knowledge.

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[23]Pinnock, *Most Moved Mover*, p. 92
[24]Pinnock, *Most Moved Mover*, p. 126
[25]John Polkinghorne, *The Faith of a Physicist, Reflections of a Bottom-Up Thinker, the Gifford Lectures 1993-1994* (Princeton, NJ: Princeton University Press, 1994), p. 169

Open theism is not demonstrably true, but it is coherent and must be taken seriously as an alternative to the classical view.

The implications of open theism superseding Calvinistic providence are profound. Our futures are open. We may choose to partner with God, becoming co-creators of the future world. Or we may choose to defy God, rejecting God's love in favor of our own path. Our choices matter, and God does not foreordain our decisions.

The questions raised by open theism may yet be resolved by new scientific findings. If physicists determine there is an underlying causal factor for the apparent uncertainty of quantum mechanics, it will weaken open theism's case for its view of omniscience. If a causal explanation can be provided for thermodynamics' arrow of time and quantum mechanics' parity in time, it will help us choose between a static and dynamic model of time. This is one of only a few areas in theology where science may yet help us decide profound theological questions.

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