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# Time in Heaven: From Glory to Glory

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## Abstract

This article addresses three questions: Is there time in heaven? If so, what is it like? and How does it relate to time in this universe? In dialogue with modern science, this paper argues that since Christianity believes in the resurrection of the body and life everlasting, it should also affirm that there is time and space in heaven. Thus, rather than picturing heaven as a changeless, eternal moment, it is better to picture is as an everlasting experience of advancing from glory to glory. The time and the space in heaven is not the same as the time and the space in this universe, but the relationship between spacetime in heaven and spacetime in this universe in shrouded in mystery. While in this universe time always advances in one direction, in heaven, we might be able to move both forwards and backwards in time, though always moving forward in glory. It is also possible that the saints in heaven could revisit different times on earth, making for a complex interaction between heavenly and earthly timelines that could explain how the saints in heaven can hear and respond to earthly prayers.

## Keywords

aeviternity, Thomas Aquinas, heaven, resurrection, time

Fundamental Christian faith, as expressed in the Nicene Creed, holds that Christians: "look for the resurrection of the body, and the life of the world to come."[1] Against a notion that death was the end and against the notion of a disembodied, purely spiritual afterlife, from the beginning Christians held that Jesus Christ was raised from the dead, leaving an empty tomb. In addition, Jesus's followers could also be raised to new life, as the Apostle Paul explains: "If the Spirit of him who raised Jesus from the dead dwells in you, he who raised Christ from the dead will give life to your mortal bodies also through

[1] Catechism of the Catholic Church, 988-91, http://www.vatican.va/archive/ENG0015/__P2G.HTM.

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his Spirit that dwells in you."[2] (Rom. 8:11, NRSV translation, used throughout). What this means, exactly, is a bit more mysterious. Our resurrected bodies are not like the bodies we have now. In his First Letter to the Corinthians, Paul responds to criticism that the resurrection of the body is absurd with an analogy from nature: "But someone will ask, 'How are the dead raised? With what kind of body do they come?' Fool! What you sow does not come to life unless it dies. And as for what you sow, you do not sow the body that is to be, but a bare seed, perhaps of wheat or of some other grain. But God gives it a body as he has chosen, and to each kind of seed its own body" (1Cor 15:35-38).[3] Then Paul offers a series of four antitheses to show how different resurrected bodies are from our present bodies: "What is sown is perishable, what is raised is imperishable. It is sown in dishonor, it is raised in glory. It is sown in weakness, it is raised in power. It is sown a physical body, it is raised a spiritual body" (1Cor 15:42-44). Unlike our natural bodies, the resurrected body is imperishable, unable to die, and imbued with glory and power. The oxymoron "spiritual body" underscores that it is incomprehensible in human language, but it must be so because, he adds, "flesh and blood cannot inherit the kingdom of God."[4]

Heaven is described variously as being in a perfect life of communion with God and the saints and the angels; as having a direct, unmediated vision of God, called "the beatific vision;" and as a recreation of the entire universe.[5] The saints receive the beatific vision before the general resurrection,[6] and thus are "in heaven" before being united with their resurrected bodies. Because of God's transcendence, we do not have the natural ability to see God face to face.[7] We can only be given this ability by God's grace. There is nothing about human nature as we now possess it that can produce the resurrection of our bodies.[8] Our souls are individually created by God and, once created, are immortal, so our souls survive our

[2] *New Revised Standard Version Bible* (National Council of the Churches of Christ in the United States of America, 1989, used throughout), Rom. 8:11.

[3] William F. Orr and James Arthur Walther, *1 Corinthians: A New Translation* (New York: Doubleday, 1976), p. 344.

[4] For commentary on the phrase "spiritual body" see: Schmisek, 'The "Spiritual Body" as Oxymoron in 1 Corinthians 15:44', *Biblical Theology Bulletin* 45 (2015):230-38 at 235, https://doi.org/10.1177%2F0146107915608597; Raymond F. Collins, *First Corinthians* (Collegeville: Liturgical Press, 1999), p. 565. Final quote is from 1Cor 15:50.

[5] A synopsis of major points of the Catholic Church's understanding of life after death can be found in *Catechism*, 988–1065, http://www.vatican.va/archive/ENG0015/__P2G.HTM.

[6] Benedict XII, *Benedictus Deus* (January 29, 1336), https://w2.vatican.va/content/benedictus-xii/la/documents/constitutio-benedictus-deus-29-ian-1336.html.

[7] *Catechism*, 1028, http://www.vatican.va/archive/ENG0015/__P2M.HTM.

[8] C.f. *Catechism*, 993-94, http://www.vatican.va/archive/ENG0015/__P2H.HTM.

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physical death. But when we die, our souls are separated from our bodies. Recreating the entire universe in perfection is beyond our human ability and is a divine action that ends the current universe and recreates it anew, so that there will be no more death and no more tears. Life without death and without suffering is impossible in the universe we currently inhabit, so heaven is not within this universe, nor is it a part of the universe. Heaven is a recreation of the universe in a perfected mode that the universe currently lacks.

## Scholastic Views of Heaven

In her book *The Resurrection of the Body in Western Christianity, 200–1336*, Caroline Walker Bynum traces the plethora of ideas about physical resurrection that wind through the patristic and medieval periods. The period ends in 1336 with the promulgation of *Benedictus Deus*, Pope Benedict XII's apostolic constitution on the beatific vision, still a watermark for doctrine on life in the resurrection. Bynum's starting point is Paul's image of the seed, which makes two things clear—there is personal continuity and radical transformation from this life to the next.[9] But Bynum argues that most medieval treatments of resurrection ignore or even reject Paul's seed metaphor, emphasizing instead material continuity and reassemblage.[10]

Thomas Aquinas, a medieval authority from the center of the tradition, theorized why it was reasonable to believe that our souls could not be destroyed once created. He argued that since we can know all of material reality without exception, our knowing cannot be material.[11] If our knowing was due to material causes only, it would be constrained by material limitations and mask our ability to know some things, in the same way as our hearing would be impaired if our ears made a noise. If our knowing is immaterial, we have at least one aspect of our souls that is immaterial. This immaterial aspect could not be destroyed by merely material processes and so would survive the corruption of the body. God creates each human soul united to an individual body at the beginning of each human life.[12] At the end of lives, there comes a point when our bodies lose their ability to remain united to our souls. Yet our souls, having an immaterial aspect and able to exist on their own, are not destroyed,

[9] Caroline Walker Bynum, *The Resurrection of the Body in Western Christianity, 200–1336* (New York: Columbia University Press, 1995), p. 6.

[10] Bynum, *Resurrection*, 8.

[11] Thomas Aquinas, *Summa Theologica* (3 vols. New York: Benzinger Brothers, 1947), 1:75.2.

[12] Piux XII, *Humani generis* (Aug 12, 1950), 36, http://w2.vatican.va/content/pius-xii/en/encyclicals/documents/hf_p-xii_enc_12081950_humani-generis.html.

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so they remain in existence, separated from our bodies, which die.[13] The soul's existence in this separated state is less rich than when it was united to a body, so God rewards good people by giving them the beatific vision and uniting their souls with glorified bodies.[14] God also punishes bad people by uniting them with glorified bodies and consigning them to hell.[15]

Aquinas speculated on the experiences of separated souls, proposing that when the just died they were immediately rewarded with the experience of the beatific vision, even before their bodies rose.[16] Aquinas based this view partly on 2Cor 5:6-10, where Paul says that here in our bodies we walk by faith, not seeing God directly, but we have confidence that we can one day be present to God out of our bodies. Aquinas reasoned that this showed "that the souls of the saints, separated from their bodies, 'walk by sight,' seeing the Essence of God, wherein is true Happiness." Aquinas further argued that although the saints experience the beatific vision even before they receive their bodies in the general resurrection, after the resurrection they can experience the beatific vision more completely by using their senses, and "all are agreed that there is some sensation in the bodies of the blessed: else the bodily life of the saints after the resurrection would be likened to sleep rather than to vigilance."[17] In the Christian tradition, heaven is not likened to sleep, but is proclaimed to be *new life* and *life everlasting*. Heaven offers real experiences that we sense through our resurrected or *glorified* bodies. I would argue that having bodily experiences in heaven implies that there is time.

Aquinas's view was opposed by some scholars such as Bonaventure, but was ultimately vindicated by Pope Benedict XII in 1336 with his apostolic constitution *Benedictus Deus*.[18] After reviewing some of the controversy surrounding this question, *Benedictus Deus* proclaimed that immediately upon death, before receiving resurrected bodies, some people would be taken into heaven where they would have the beatific vision, others would be taken to hell and suffer, and others would pass through a purgation and then enter into the beatific vision, again, before they received their resurrected bodies. In any case, a general resurrection would come when all would receive glorified bodies, appear before the judgment seat of Christ, and receive reward or punishment for the good or evil they had done in this life. Once a person began to receive the beatific vision, either

[13] Aquinas, *Summa Theologica*, 1:75.6.
[14] Aquinas, *Summa Theologica*, Supplement:75.1
[15] Aquinas, *Summa Theologica*, Supplement:75.2
[16] Aquinas, *Summa Theologica*, 1-2:4.5. Also asserted in Thomas Aquinas, *Summa Contra Gentiles*, 4:91.10, https://dhspriory.org/thomas/ContraGentiles.htm.
[17] Aquinas, *Summa Theologica*, Supplement:83.3.
[18] Benedict XII, *Benedictus Deus*.

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after a period of purgation or not, the experience would continue forever without interruption or diminution.

## Scholastic Views of Time

For the medievals, time as we experience it was just one of several durations that exist.[19] There were also the movements of the heavens and the angelic beings called *aeviternity* (the aevum), and God's eternal existence (in *eternity*). There was a robust discussion of time in medieval philosophy, with much disagreement. There was, however, a general agreement on the basic definition of time.[20] Following Aristotle, most medieval Christian philosophers accepted a definition of time as the measure of movement in regards to *before* and *after*. There was also an agreement that there was no motion in God, so God's eternity was like an eternal moment, an unchanging *now*, with no before or after.

There was disagreement about how to speak about aeviternity, particularly when it came to angels. In medieval philosophy, angels were seen as immaterial beings created by God without bodies, so they were not bound up in the time experienced by our bodies and all physical things. Angels were created sinless, yet the chief angel, Satan, had chosen to separate himself from God and was thus cast into hell. This decision entailed a motion of thought, with a change from *before* to *after* the decision. Is aeviternity, then, extended, with a series moments, or is aeviternity unchanging, like God's eternity? In *Time and Eternity in Mid-Thirteenth Century Thought*, Rory Fox denotes two main schools of thought along these lines, which he broadly labels "Dominican" and "Franciscan."[21] The Franciscan school was led by the Franciscan theologian Bonaventure who favored seeing aeviternity as extended, like our time, consisting of a series of moments, in order to preserve the transcendence of God who alone lived in eternity. The later Franciscan John Pecham added that a non-extended aeviternity would entail the logical contradiction that Satan had both chosen and not-chosen to rebel against God at the same time. The Dominican theologian Albert the Great argued that angels were unchanging, and thus aeviternity, like eternity, was totally extensionless. Fellow Dominican Thomas Aquinas added that aeviternity is distinguished from eternity by being "related" to change, while God's eternity is in no way related to change.

[19] Rory Fox, *Time and Eternity in Mid-Thirteenth-Century Thought* (Oxford: Oxford University Press, 2010), 1.

[20] Fox, *Time and Eternity*, 11.

[21] Fox, *Time and Eternity*, 264-273.

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Fox asserted that both the Franciscan and Dominican positions had internal incoherence and did not resolve all the issues they each admit existed, adding: "Thirteenth-century reflection on the aevum resulted in what must arguably be one of the least satisfactory attempts to synthesize theology and Aristotelian philosophy."[22] The problem was so bad, he argued, that the whole philosophy of aeviternity was simply set aside and slowly slipped away from mainstream intellectual thought. One specific disagreement Fox documented, however, is important to the discussion at hand. According to Aristotle—and accepted by both sides—time is a continuous stream. Between any two moments of time, there are always an infinite number of other moments. In order to place aeviternity midway between time and eternity, Aquinas argued that while time in this world was indeed continuous, the angels, not having bodies, were not subject to this time. For Aquinas, angelic movement was measured in discrete acts of intellect, wherein in one instant all were good, but in another instant, some were bad.[23] For this reason, angelic time was not a continuous set of moments, but was a discrete series of moments. Angels therefore experienced a kind of time, but it was a different kind of time than we experience. In rebuttal, Pecham, the Franciscan, argued that if angels could communicate with us, their time must be able to correlate with our time, and so, if our time was continuous, with an infinite number of instants between any two given points of time, those in-between instants must also exist in angelic time, making it continuous.

We do not have a record of Aquinas or another Dominican responding to Pecham's criticism, but Fox believed that it would have been difficult for Aquinas to have done so, since Aquinas also held that angels interacted with our world with its continuous time—watching it, learning, and bringing about good effects.[24] Fox wrote that Aquinas's notion of angelic discrete time was so incoherent that it was never explained by the Dominicans, and in fifty years allowed William of Ockham, another Franciscan, to scrap the idea of angelic time all together, and simply affirm that angels were measured by ordinary time.[25] I will return to this argument later, responding to the critiques of both Fox and to Pecham, taking a position in line with Aquinas.

[22] Fox, *Time and Eternity*, 281.
[23] Fox, *Time and Eternity*, 275.
[24] Fox, *Time and Eternity*, 277.
[25] Fox, *Time and Eternity*, 278.

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## Modern Views of Space, Time, and Spacetime

Albert Einstein revolutionized science and ushered in modern physics with his theory of relativity, first proposed in 1905. Einstein sought to explain an anomaly in classical physics—that the speed of light in a vacuum was constant, irrespective of the motion of the observer. This is something that is difficult to notice in our day-to-day experience, but with the advent of telescopes that could look at the stars and the planets, it became a problem that could not be explained. In classical physics, light was thought to travel through a medium called *ether*, just as sound travels through a medium such as water or air, moving the particles of the medium. In 1887, in order to detect ether and measure its effects on light, Albert Michelson and Edward Morely used the earth's rotation around the sun to measure how the speed of light was affected by motion through the ether. If one picked the right celestial object, the Earth would be moving towards it in the spring, orthogonally to it in the summer, and away from it in the fall. A sensitive instrument mounted on Earth could measure the apparent speed at which light approached the Earth when it was moving in these different directions relative to the celestial object. When the experiment was performed, Michelson and Morely were surprised to find that the speed at which light appeared to be approaching remained constant, whether or not one was going towards it, away from it, or traveling at any angle in between.

To see why this is surprising, imagine two trains going 100 miles an hour down a track with you on the front train. The train following you would not be gaining on you. Its speed relative to you would be zero mph. Now, imagine your train slowing down to 80 mph. The rear train would appear to be approaching you at 20 mph. If you stopped altogether, the relative speed of the approaching train would be 100 mph, which would be rather alarming. In the Michelson-Morely experiment, light (the other train) appeared to be approaching Earth (our train) at the *same speed* no matter if we were moving towards it, away from it, or at right angles from it. This makes no sense either intuitively or in classical physics.

Einstein theorized that this could make sense if time and space were not independent of each other but intrinsically related such that space contracted (got smaller) in the direction of relative motion. The specifics of Einstein's theory of relativity are difficult and there are a number of counterintuitive consequences, but they have proven to be quite accurate in explaining how the universe works. It appears, therefore, that Einstein's insight that time and space are intrinsically related is true, and we can refer to them as *spacetime*.

Modern String Theory is exploring the possibility that the universe has even more than four dimensions, but this does not annul an intrinsic connection between time and space. To understand the

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implications of multidimensional space, imagine Flatland, a universe with just two physical dimensions, like a piece of paper.[26] Not much would change. We could see each other and move past each other just as we do now, only in two dimensions instead of three. But then imagine that something existed in Flatland that could move in a third dimension, orthogonal to the paper. By moving in this additional dimension it could move off the page, giving it the ability to disappear from one place on the paper and reappear in another, without having to travel from the first to the second. It could go through walls at will by going around them in the third physical dimension. Such are the possibilities that string theory explores. But, any movement at all implies time, and thus spacetime in Flatland would have three dimensions, two physical dimensions and time. Time is required for movement and change and life. If string theory eventually discovers that there are really ten physical dimensions, relativity would add that spacetime has eleven dimensions.

However many dimensions we ultimately determine the world to have, an intrinsic connection between space and time causes philosophical problems with the nature of time. We experience time as flowing by, with a past that is fixed and gone, a future that is undetermined and yet to be, and a present that is ever with us. In our normal experience, the past is inherently different than the future. The past is fixed, the future is open to multiple possibilities. In modern philosophy, this would be called an A-theory of time, in contrast to B-theories of time, which assert that our experience of time as flowing is an illusion.[27] B-theories of time assert that time is strictly analogous to space, so just as there is no inherent difference between two physical places, here and there, there is no inherent difference between the present and the past or the future. In *Time in Eternity: Pannenberg, Physics, and Eschatology in Creative Mutual Interaction*, theologian Robert John Russell notes that most contemporary modern philosophers and scientists hold B-theories of time, while most theologians hold A-theories of time.[28] In particular, most interpretations of Einstein's special theory of relativity strongly favor B-theories of time. One such argument is that in classical calculations of distance, all points along a line are presumed to exist simultaneously. That is why we can measure them. In the same way,

[26] The idea of Flatland comes from a satirical novella by Edwin Abbott, *Flatland: A Romance of Many Dimensions*, published in 1884. However, the idea of this two dimensional world helping us to understand multidimensional physics has taken on a life of it own. For a very good description, watch Carl Sagan, *"Flatland and the 4th Dimension"* (YouTube, September 6, 2014), https://www.youtube.com/watch?v=iiWKq57uAlk.

[27] Robert John Russell, *Time in Eternity: Pannenberg, Physics, and Eschatology in Creative Mutual Interaction* (Notre Dame, IN: University of Notre Dame Press, 2012), p. 126-27.

[28] Russell, *Time in Eternity*, 124-25.

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then, a distance measured in relativistic spacetime, which necessarily includes temporal and spatial dimensions, presumes that all the points in time and space exist simultaneously.[29] Just as we can measure the length of a table in classical physics because the table exists all at once, in relativistic physics we can measure the distance between two events, one that happened yesterday and one that happened today, because they both exist simultaneously. "Past" and "future" are relative constructs, like "here" and "there," being as simultaneously real as the present.

As a theologian, Russell locates God's action as actualizing a particular present from one of many potential futures, and it is this action of God that provides the basis for the flow of time.[30] Theologically, then, Russell is committed to A-theories of time that support the reality of the flow of time. The goal of his book is to put forth a new A-theory of time that could serve as a valid interpretation of time in special relativity and be acceptable to modern philosophers and scientists who are currently supporting B-theories of time. Like Russell and most theologians, I presume that the flow of time is real and that time has a direction, and so I applaud his efforts to square this view with the theory of relativity. It seems to me to be an essential Christian insight that God is bound up with history, working to bring forth a better future and ultimately to perfect creation, so any theory of time that could not support the reality of history would be impossible to reconcile with Christianity. This article does not depend on any particular theory of the nature of time. It presumes an A-theory of time, but it does not rule out a B-theory of time. It might be productive to pursue a B-theory for time in heaven, but that would be for another article.

Quantum physics also opens up the possibility that the universe is far more complex than it appears to us on a conventional level. At the atomic level, where quantum effects predominate, particles such as electrons cannot be pinned to a specific location at a specific time. Instead, they have a probability of being in certain places that is spread over space and time. Erwin Schrödinger theorized that perhaps these various probabilities were not simply alternatives but all really happen simultaneously in alternative universes.[31] If this were true, there would be an infinite number of universes that all existed simultaneously, while we would only experience one of them. More importantly, quantum physics dictates that space and energy are not continuous but take on specific, discrete values. For instance, an electron orbiting the nucleus of an atom can only be in particular,

[29] Russell, *Time in Eternity*, 284-85.

[30] Russell, *Time in Eternity*, 131.

[31] John Gribbin, *Erwin Schrodinger and the Quantum Revolution* (Somerset: John Wiley & Sons, 2013), p. 222.

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quantifiable orbits and not anywhere in between them. It would be as if a planet had to be in Mars' orbit or in Venus's, and it could change from one orbit to another, but only by moving instantaneously between the two orbits without passing through the space in between. At the quantum level, time appears to be continuous, but it could come in discrete units so small that we cannot perceive them.

We have yet to find a universal "Theory of Everything" that would unify both the theory of relativity and quantum physics. There are indications that at least one of these theories will have to change in order for them to be reconciled, so it is unclear if all the specifics of either theory will hold true in the long run. For instance, fundamental to relativity is that nothing can move faster than the speed of light—even information and the propagation of the effects of change. Fundamental to quantum physics is that changes produce effects everywhere simultaneously, even at great distances. Do the repercussions of changes take time to propagate through space or not? The theories disagree. So we cannot yet be sure whether, in the end, space is actually continuous, as the theory of relativity holds, or discrete as quantum physics holds; and since in both theories time and space are intertwined, it is unclear if spacetime is ultimately discrete or continuous.

## Heaven as a Place

Let us now put these various threads together and begin to theorize about time in heaven. We do not know much about heaven, the resurrection, or what our life will be like there, but by faith we do know some things. For instance, in heaven we will see God "face to face," and there will be no more tears, only joy. As a re-creation of the universe, heaven must be a physical place, but not a place in this universe as it currently exists. Nor is heaven currently connected to the universe by the laws of physics. Our rebirth in heaven is only possible through an act of God separate in time from the act of the creation of the universe and the act of the creation of our individual souls. Here in this life we cannot see God face to face because God transcends creation. There is no technology we could develop that could ever bridge this gap. God is the bridge between this world and heaven, the new creation. Heaven cannot be hiding in a parallel universe connected by quantum effects to this one, nor in some yet to be discovered extra dimensions, or else God would not truly transcend the universe.

By contrast, if our immaterial souls are naturally incorruptible, such that when our bodies die our souls continue in existence through their own power, then there exists an immaterial aspect to the universe that we might properly call "the spiritual realm." This spiritual realm must

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be connected to the physical universe by the laws of nature. This does not deny that God creates human souls individually through a special act of creation, but if God is able to do this and not have to make a further intervention to hold these souls in existence when the bodies they are united to die, then the universe as it exists naturally includes immaterial souls.

The connection between our immaterial souls and the physical universe is philosophically analogous to the connection angels have to this universe. We might wonder if there is a connection built into the nature of reality that allows angels to interact with the physical world we live in or is every angelic interaction with humanity made possible only by a distinct miracle of God. Arguments could be made on both sides, since angelic interactions do seem miraculous, but it would entail allowing that God also specifically upholds and miraculously fosters interactions with the devil as well. Solving this conundrum is beyond the scope of this article.

## Time in Aeviternity

Easier to puzzle through is the question of time in other contexts, such as the afterlife and aeviternity. Let us use Aristotle's definition of time as the measure of movement in terms of before and after. If a rock falls down a hill, we can measure the movement in terms of position as well as time. In position, we have two endpoints of the motion, the top of the hill and the bottom, but they would be in no particular order. Time gives the points an order. In time, it was at the top *before* and it is at the bottom *after* it fell. In our definition, *movement* can be broadly interpreted. When I change my mind, there is a movement, not in space but in opinion. Before, I thought *that*, and after I changed my mind I think *this*. Without bringing time into the description, there are only two opinions. With the addition of time, I can say that I changed *from* one opinion *to* the other. "Time" here does not need to refer to a specific chronological time—for instance 8:04 AM CDT, 2 July 2018—it can simply denote an ordering of my thought. Since I am human, one could presume that I changed my mind at some particular time, but the ordering of my thoughts in terms of before and after does not require specificity in chronological time in order to make sense.

As we saw, Thomas Aquinas believed that angelic time was measured in operations of the intellect. Human knowledge of all things except first principles is discursive. We observe the world, reason about it, and thus come to knowledge. Aquinas believed that angelic knowledge was non-discursive, already fully formed within their

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nature.[32] Angels did not have to think about things and figure them out, they just "look within" and their knowledge is already present. For Aquinas, angelic time—which is marked by angelic thoughts rather than by physical movement—is discrete rather than continuous.

As for Pecham's critique—that if angelic time were discrete while our time was continuous, the two times could never be correlated and angels could not communicate with us—such views can be shown to be false two ways.[33] Aquinas could have responded that God, changeless and eternal, can interact with a time-bound, changing world, and so correlating timeframes are not required for communication. God is the efficient cause of everything that exists, but is not changed in causing things to exist. There is thus no reason to assume that angelic time would have to correlate with our time in order for angels to communicate with us.

In addition, a modern rebuttal of Pecham could point to the reality of information processing in our digital age. Pecham's argument was that if there was a movement from 'a' to 'b' in discrete angelic time, such that 'b' is not 'a', it could not correlate to any movement between 'c' and 'd' in our time (where 'c' was not 'd'), since there would be an infinite number of points between 'c' and 'd' and none between 'a' and 'b'. But digital computers deal with information in discrete chunks, dealing with everything in terms of '1's and '0's, with nothing in between. Yet digital computers can model information in the real world, where many quantities are continuous, and can communicate that information back into the world of continuous time effectively. For example, human speech encodes information in sound waves, which are continuous. Yet a digital computer can take in these sound waves, break them into discrete digital chunks, make sense of them, synthesize a response, and communicate that response back to us in the form of digitally created sound which, by its nature as sound, is continuous. So I can say to my smartphone, "What is the weather like?" and it will respond audibly with, "it's 76 degrees and sunny in Minneapolis."

That digital computers can effectively model our continuous world with discrete numbers is possible because digital numbers can be made as arbitrarily close to continuous sequences as they need to be for any particular task. Integers (1,2,3 . . . ) are numbers that are countable and discrete. They are discrete because the sequence jumps from 1 to 2 with nothing in between, and this makes them countable as well. Real numbers are any value that can represent the distance along a line. There are always intermediate values between any two real numbers—for instance, between 1 and 2—so they are continuous and

[32] Thomas Aquinas, *De veritate*, 8:15, https://dhspriory.org/thomas/QDdeVer8.htm.

[33] The rebuttal of Pecham was worked out in discussion with my colleague Peter Hunter, to whom I am indebted.

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non-countable. Rational numbers are fractions made out of integers, such as 1/2 and 345/67. Since these are made up of integers, they are countable and discrete. However, rational numbers can approximate real numbers as closely as required by simply using larger integers. Instead of 1/2, we could use 1001/2000 or 100000001/200000000. So the set of rational numbers is not continuous, but it can approximate continuity. Digital computers use rational numbers to approximate the real numbers that exist in our world to the degree of precision that is required for a particular task.

## Time in Heaven

Aquinas does not comment on the issue of time in heaven directly, but he sometimes forwards a view of heaven as changeless. His argument is that, as intellectual creatures, we always desire to know the essence and cause of things.[34] This desire cannot rest until we behold the first cause of everything, which is God. Therefore, our ultimate end is the vision of God in his essence—the beatific vision. Having the beatific vision, all of our questioning would cease, because we would find all answers in God, and our only desire would be to gaze on the perfection of goodness in God. Thus, in the beatific vision, we would rest "in perfect repose or unchangeableness as regards both intellect and will."[35]

This view has led some to believe that there is no time in heaven—that heaven is atemporal, as is God's eternity. For instance, William Charlton argued that the beatific vision represents a divinization and a sharing in the very life of God.[36] Since God's life is atemporal, our life in heaven must be atemporal.[37] Charlton further argues that all life in heaven is a direct participation in the life of God, grafted into the Trinity, as it were, so that we have no further need of a body of our own: "We need a body in order to act causally in the natural world … but causal action is temporal, so the end of time must be the end of causal action."[38] John McDade similarly asserted that in heaven "time will unravel into a completed simultaneity of all moments," and, "the extension of space will collapse into the

[34] Thomas Aquinas, *Compendium of Theology* (Translated by Cyril Vollert, St. Louis, Mo: Herder, 1947), 1:104.

[35] Aquinas, *Compendium of Theology*, 1:149.

[36] William Charlton, 'Heaven,' *New Blackfriars* 97 (2016):547–59 at 556-57, https://doi.org/10.1111/nbfr.12206.

[37] Charlton, 'Heaven', p. 555.

[38] Charlton, 'Heaven', p. 558.

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immediate omnipresence of all things to one another because every thing will be in deep God."[39]

It is difficult to reconcile these positions with any robust sense of bodily resurrection, such as what is indicated in Isaiah 40, which says that those in heaven will run and not grow weary. Aquinas cited this verse in arguing that glorified bodies move about in heaven in order to see and enjoy the great diversity of creatures there.[40] Although glorified bodies need to roam about to see the various creatures, since physical things can only see what they are physically near, such movements would not diminish their enjoyment of God since God is present everywhere in heaven. These movements are therefore independent of the beatific vision, but they are only possible if there is time and space in heaven.

Heaven must have physical dimensions or it would make no sense for Christians to proclaim a *bodily* resurrection rather than a *merely mental* resurrection. However, the physical dimensions in heaven do not correspond to the physical dimensions in this universe. Heaven is not up or down, above or below us, as we reckon these things. A physical heaven that made sense of a bodily resurrection would have dimensions, but they would be different dimensions than we use in this universe, corresponding to a different space. If heaven has life and sensations it must have change of some sort, and thus it must have time. The alternative would be that things are in particular locations in heaven but cannot move, because there would be no *before* and *after*. It would be hard to posit life with bodies that did not move, especially not a fulfilling life that would be an ultimate reward. Like Aquinas, I would want to see what's on the other side of my heavenly town. It would not be enough to know what's on the other side of town or to be shown it virtually. If I had a body in heaven, I would expect to be able to physically go there.

We could also look to Einstein's theory that space and time are intrinsically linked. If this is correct, perhaps it is not simply true here in this universe, but is simply true. Then, if heaven had space, it would have time. Since heaven is a different space than our universe, spacetime there would not be the same as spacetime here. We could call it *heavenly spacetime*, as we call what the angels experience *angelic time*.

How different could heavenly spacetime be from our spacetime? Heaven would not obey the laws of thermodynamics that govern our universe. There would not necessarily be conservation of energy, so our arrival there could be a net addition. More importantly, entropy would not inexorably increase over time in heaven as it does here.

[39] John McDade, 'Heaven, Then and Now,' *New Blackfriars* 83 (2007):42-48 at 42, https://doi-org.ezp.slu.edu/10.1111/j.1741-2005.2002.tb07738.x.

[40] Aquinas, *Summa Theologica*, Supplement:84.2.

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Entropy is a measure of the disorder or blandness of a closed system, such as the universe taken as a whole. In our universe, over time, temperatures even out, order eventually falls into disorder, and life has to come to an end because there will no longer be usable energy to sustain it. For example, if something hot is touching something cold, heat will always flow from the hot item to the colder one, unless more energy is input to reverse this flow. Heat never spontaneously flows from the colder one to the hotter on, making the cold colder and the hot hotter. In a closed system, entropy always increases over time and never decreases. This gives an arrow to time. Time only moves in one direction, the direction of increased entropy. We can move backwards and forwards in space, but not in time.

If there is no death in heaven—not merely prolonged life—then the law of entropy cannot hold there. Heaven is not slowly winding down. With no law of entropy, perhaps there is no arrow of time in heaven. Gideon Goosen, a theologian who works in dialogue with modern science and has thought about the paradoxes that would come if we lost the arrow of time, points out that the law of entropy is not the only reason that the arrow of time points only forward, citing also "the arrow of the increasing complexity in the universe; the universe's expansion; cause-and-effect ordering; and human temporal experience."[41] Yet, with the proclamation of the Immaculate Conception of Mary, the Church already asserts that the law of cause and effect can work backwards in time.[42] Normally, effects can happen at the same time as their causes or later, never before their causes-hence the arrow of time. However, in the Immaculate Conception, the redeeming work of Christ reached back in time to preserve his mother from original sin at her conception. If the law of cause and effect does not hold the arrow of time pointing in one direction always in this universe, we can hardly expect it to do so in the new creation. Perhaps we could ascribe the Immaculate Conception to heaven breaking into the world and altering it, but this would only strengthen the argument that the laws of cause and effect work differently in heaven. As for the other reasons for presuming that the arrow of time would hold in heaven as it does in this life—the increasing complexity and expansion of the universe and the data of human experience—they are tied to our experience of this universe and would not be applicable to heavenly spacetime.

There is a different reason to hold for some kind of directionality in heaven, one that does not apply in this universe: in heaven change should always bring about greater glory. In this life we move forward and backwards in our knowledge and our holiness. When we learn,

[41] Gideon Goosen, *Spacetime and Theology in Dialogue* (Milwaukee, WI: Marquette University Press, 2008), p. 59.

[42] Goosen, *Spacetime and Theology*, 115-16.

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we move "forward," but sometimes we also forget what we have learned. In this life we hope that we learn to become more loving, wiser, and holier as we grow older, but we know that this is not always the case. In heaven, if there are no more tears, we would not regress in wisdom, holiness, love, or knowledge. This would cause an arrow of in the direction of growing in virtue and perfection. However, growing in virtue and perfection would not necessarily mean always moving forward in perceived time. For example, perhaps we did not plumb the depths of a particular experience in heaven. Could we relive it? Wouldn't this be better than merely thinking about it? I see no inherent reason against such a possibility.

If we have experiences at all in heaven, even as we continue to have the beatific vision, heaven is not static, but unfolding. While we continually experience the joy of the beatific vision, we also have experiences with our glorified bodies and learn from them, because having experiences and learning from them is natural to humans. Learning will not cease in heaven, but will continue in a perfected way, befitting our perfected bodies and purified souls. The Apostle Paul describes life in Christ as progressing "from one degree of glory to another," or more literally, *from glory to glory* (2 Cor 3:18). Should we not, then, picture heaven as forever progressing in knowledge and love, from glory to glory?

Goosen has examined these same data points but has come to slightly different conclusions. Goosen wrote that the Catholic Church's penchant for holding on to an idea of heaven as a place that has time without end is an erroneous distortion caused by wrongfully projecting our current experience onto ultimate things, and added that holding on to these ideas "inhibits one's ability to think more imaginatively of the realities beyond spacetime."[43] This article has put forth my reasons for deciding differently, positing a heavenly spacetime that functions differently than our own spacetime but similarly enough to want to use the same words, such as "place" and "time." Both Goosen and I agree that life heaven has to be different than life in this universe, but in answer to his rhetorical question, "Why then not a revision of what we have held up to now," I would answer that in this case the deeper truth is found not by changing what we have come to believe but by creatively building on what we have believed in light of what science has discovered.

This progressive vision of heaven agrees with that put forth by Robert John Russell in his book *Time in Eternity*, cited above. One of the parameters Russell uses to evaluate theories of time is how can it be possible for creation as it is now to be transformed into the *new creation* of heaven. Russell rejects views of the new creation that

[43] Goosen, *Spacetime and Theology*, 66-68.

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would see it as merely an evolutionary advance of the current creation or as a complete disjuncture with the current creation.[44] More importantly for this study, Russell puts forth a vision of heaven in which individuals retain their unique personal histories, "but without the separation of times into a past that is forever gone and a future that is never available in the lived moment such as it is in the kind of temporality we now experience."[45] This would be a "true temporality" preserving the flow of individuated moments without collapsing them into a single timeless moment. "It is an eternity in which we will experience everlasting life with all of our present life available to enjoy endlessly in ever-widening and deepening experience."

God is infinite. We are not infinite, even in heaven. For humans, to know fully is to know with our whole mind and our whole heart, with every fiber of our being. We expand our understanding though reflecting on experience based on what we already know. But when we know more, we can understand more, and so we can always progress in our knowledge. Why should this process change in heaven? Knowledge builds on itself. While this is true here in this life, I believe that it remains true in heaven in a more pure form. While here we struggle and sometimes fall back in understanding or take a wrong path, in heaven, the motion will be forever towards greater knowledge and love, glory upon glory.

## Heavenly time and our time

Finally, let us examine the relationship between heavenly spacetime and our spacetime. Since the only connection between heaven and earth is through God, there are no natural laws that connect these two times. God could establish the correlation between these two spacetimes in any way God saw fit. If time could move both directions in heaven, then even past and future do not correlate easily between heavenly spacetime and regular spacetime. Three events that happened here in a temporal sequence *a* then *b* then *c* could happen in heaven in a different sequence, such as *a* then *c* then *b*.

This complicates questions such as "did the general resurrection happen yet?" By our reckoning the general resurrection is waiting for the "end of time," immediately preceding the last judgment, when Jesus will judge the living and the dead.[46] The second coming of Jesus marks the end of time in this universe, as a new heaven and a new earth will be established, and all of creation will be

[44] Russell, *Time in Eternity*, 182.
[45] Russell, *Time in Eternity*, 5-6.
[46] C.f. Jn 5:26-29.

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transformed.[47] But how the end of time in this universe correlates to heavenly spacetime is another question.

Scripture scholar Gerhard Lohfink addressed this question and came to the conclusion that from the perspective of heaven, earthly time exhibits a "simultaneity" that excludes being limited by *before* and *after*.[48] I agree with that this and with Lohfink's other theorizing about the resurrection heaven, but I would go further. God is outside of time and can thus see all time—past, present, and future—at a single glance. God can do this because God has an infinite understanding. We are finite beings and do not have an infinite understanding, even in heaven, so the resurrected in heaven cannot see all time at a single glance. We can understand any particular thing by discursively learning and thinking about it, but our awareness is limited by our finite nature. But, might it be possible that after the general resurrection, the blessed in heaven could see all time—past, present, and future—by going there? As Aquinas noted, to become aware of the variety of things in heaven would require us to travel around to see them. Returning to the question of the arrow of time in heaven, might the resurrected have the ability to move forward and backwards in our spacetime, able to revisit any particular point in our history by traveling there? Imagine if you could go back to watch a confusing and painful experience unfolding in your own life, knowing what you know now. You could perhaps see more clearly what really happened and could come to understand yourself and others in new ways. This sounds like something of heaven.

If the resurrected in heaven could travel back to what is our present day, then in some sense they would already be resurrected in our present day. Thus, the saints could hear our prayers and intercede on our behalf, even though, in our spacetime, we have not reached the end of time and they have not yet resurrected. Praying for the intercession of saints is an important part of Catholic piety, but it is difficult to understand how it could be possible. Before the general resurrection, the saints can attain the beatific vision, with their minds directly experiencing God; but, without a body, they could not experience other things. How, then, could they hear our prayers and respond to them by lifting up a new prayer to God? Such actions seem to be proper to the fullness of life after the resurrection. But the way we reckon time, if the world has not ended then the general resurrection has not happened and the saints, apart from Mary, have yet to receive their resurrected bodies. A more complex relationship between time in heaven and time on earth could allow for the saints to be, in our reckoning of time, both resurrected and able to hear us,

[47] *Catechism*, 1042-50.

[48] Gerhard Lohfink, *Is This All There Is?: On Resurrection and Eternal* Life (Collegeville, MN: Liturgical Press, 2017), p. 210.

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and awaiting the general resurrection, seeing only God. So while I do not disagree with Lohfink, I would not use the word "simultaneity" to describe this relationship, but would instead simply emphasize that the blessed in heaven have unfettered access to all of the *befores* and *afters* on earth and are not bound by their earthly sequencing.

## Conclusions

We do not know much about heaven, but we do have some indications about it thanks to God's revelation: because of the saving work of Jesus Christ, there is a life waiting for us after this one, a life with no more tears and no more death, where we will be able to see God face to face, and where we will once again have a body—a body that is incorruptible and full of power and glory. God's faithful ones will be rewarded with bodily resurrection and life everlasting in heaven. Bodily resurrection only makes sense if our bodies are in a place and have motion. Hence we should also affirm that there is space and time in heaven, and a life progressing from glory to glory.

In heaven, we will not be infinite beings with an infinite ability to understand. Like the grace of the incarnation of Jesus moving backwards in time to preserve Mary from the stain of original sin, we might be able to move backwards and forwards in time in heaven—though we would always be moving forward in glory. Instead of an arrow of time, then, as we experience it in this universe, there will be an arrow of glory in heaven such that we are always experiencing greater and greater glory, joy, and holiness.

This goes against a popular view of heaven as a completely timeless experience of beatitude. The beatific vision is indeed an essential part of heaven, but it is not the totality of it, for we have the beatific vision even before the general resurrection, when all the faithful will receive glorified bodies. What more do these glorified bodies add to our experience of heaven? Along with Thomas Aquinas, I argue that glorified bodies complete us, allowing for a fullness of life in which we could move about in order to see and enjoy the great diversity of creatures in heaven. Sensations and motion require time. Just as it is unclear what Paul means by saying that we will have "spiritual bodies" in heaven, it is unclear what time will be like in heaven; but just as it was important for Paul to nonetheless assert that we had some sort of bodies in heaven, it is important for us to assert that there is some sort of time in heaven.

Heaven is a place, but not a place in this universe or in any parallel universe or hidden dimensions connected to this one by the laws of physics. In his theory of relativity, Einstein posited an inherent connection between space and time. If this is true about the universe we live in, and it appears to be so, then perhaps it is true also in

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heaven. But since the space in heaven is a different space than that of this universe, the time in heaven would be a different time than time in this universe. Heavenly spacetime obeys different rules than spacetime in this universe. The law of entropy, which is operative in the universe, could not apply to heaven or there could not be eternal life. Thus it is possible that in heaven we might be able to move both forwards and backwards in time. It is also possible that saints in heaven might be able to see any particular time in this universe, even their own past. This would explain why the saints in heaven could hear and respond to our prayers, even though, as we reckon time, they have yet to receive resurrected bodies.

Why does it matter if we believe that there is time in heaven? First, time is essential in making sense of our bodily resurrection, which is a fundamental Christian belief and one that is on shaky ground in popular understanding. Without time, there could be no motion or sensation. It would be very odd to have bodies that could not move or sense, and it would be difficult to see such bodies as a reward or as the fullness of life.

Second, it causes us to give greater value to how we spend our time and value our experiences here and now. If existence in time is simply passing away, we give less importance to the aspects of reality that are tied time, such as how we pass our days or the joy that can be had in an experience.

Third, having a functional picture in our minds of what life will be like in heaven motivates us to ultimately get to heaven and to shape our reality here and now in conformity with life in heaven. A vague understanding that heaven is "nice" is motivationally equivalent to being agnostic about the existence of heaven at all. Most people I ask: "Do you believe in bodily resurrection and what does that mean?" answer: "Well, I haven't really thought about it much. I don't know what I believe." If we don't think much about heaven, then our life in heaven is not a motivating factor for how we live life here. But it should be.

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