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Newton, Einstein and Barth on time and eternity

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Abstract

For two hundred years after 1687, Newton's notion of absolute time dominated the world of physics. However, Newtonian metaphysical absolute time is so ideal that it may only be realised and actualised by God. In the early twentieth century, Einstein breaks this dominant understanding of time fundamentally by his Special Theory of Relativity and General Theory of Relativity. In the Einsteinian paradigm, we are forced to think no longer of space and time but rather to look at a four-dimensional space-time continuum, in which time appears to be more space-like than temporal. The Newtonian theory implies that there is an absolute, dominant point from which the universe can be observed, whereas Einstein argues for the opposite: there can be no vantage perspective and no universal present by which God can divide past and future.

Barth takes a trinitarian approach to interpret the concept of time. For Barth, the Father is coeternal with the Son and the Holy Spirit. The eternal immanent Trinity acts concretely as the temporal economic Trinity, thus the triune God is pre-, supra- and post- to us. In actual temporality, the Father, Son and Holy Spirit transcend time concretely in our history and penetrate time absolutely from divine eternity. God's eternity is both transcendent and immanent to human time.

Such a trinitarian temporality might serve as a 'dynamic privileged perspective' since time, energy and movement are all created by God from eternity. On the one hand, the triune Creator transcends his creature and its creaturely form – time absolutely; on the other hand, even when God enters time and moves together with the time 'uniformly' in the Son and the Holy Spirit, he becomes concretely simultaneous with all time. Also the Barthian perspective might provide something which is lacking in Einstein's relative time, i.e. the direction of time from the past to the future. Since every historical event in Einsteinian four-dimensional continuum is posited as a static space-time slice and Einstein equations are time-reversible, there is no ontological difference between time dimensions at all. However, in Barth's trinitarian opinion, such extraordinary events as the creation, resurrection and Pentecost are ontologically superior to other events in human history because they do change our temporality in an absolute way. Penetrated by the trinitarian eternity, those discrete space-time slices also become communicable and hence take genuine temporal characteristics, i.e. the past, present and future.

Keywords: absolute time, Barth, Einstein, Newton, relative time, trinitarian eternity.

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Classical physics and the Newtonian absolute time

Sir Isaac Newton is undoubtedly the father of the modern scientific concept of time.[1] After the publication of *Philosphiae Naturalis Principia Mathematica*,[2] known as the *Principia*, in 1687, Newton's notion of absolute time dominated the world of physics for the next two hundred years. He defines absolute time by distinguishing it from its opposite, namely, relative time:

> Absolute, true, and mathematical time, in and of itself and of its own nature, without relation to anything external, flows uniformly and by another name is called duration. Relative, apparent, and common time is any sensible and external measure (precise or imprecise) of duration by means of motion; such a measure – for example, an hour, a day, a month, a year – is commonly used instead of true time.[3]

Newton's relative time is something like the traditional Aristotelian notion of time, which cannot be separated from motion for it is measured by the means of motion and, therefore, it is the measure itself. On the contrary, absolute time is distinguished from relative time by 'the equation or correction of the apparent time'. Newtonian absolute time can exist independently, namely, without any motion and measurement.[4] Absolute time does not, like relative time, derive from motion and measure. On the contrary, it should be understood as a kind of transcendent measurement, which is a result of rational imagination rather than empirical observation. For example, when I agree to meet someone at 10:00 am, and my watch shows it is 10:02 and my colleague's watch shows it is 9:59, obviously we are

[1] For Newtonian opinions of time, with special reference to its influence on philosophy and theology, see Wolfgang Achtner, Stefan Kunz and Thomas Walter, *Dimensions of Time*, trans. Arthur H. Williams, Jr. (Grand Rapids, MI, and Cambridge: Eerdmans, 2002), pp. 110–14; Philip Luscombe, *Groundwork of Science and Religion* (Peterborough: Epworth Press, 2000), pp. 30–2, 130–2; Lawrence Osborn, 'Theology and the New Physics', in Christopher Southgate (ed.), *God, Humanity and the Cosmos* (London and New York: T & T Clark International, 2005), pp. 119–28; Peter E. Hodgson, 'Relativity and Religion: The Abuse of Einstein's Theory', *Zygon* 38/2 (June 2003), pp. 393–409.

[2] Isaac Newton, *The Principia: Mathematical Principles of Natural Philosophy*, trans. I. Bernard Cohen and Anne Whitman (Berkeley and Los Angeles, CA: University of California Press, 1999).

[3] Newton, *Principia*, p. 408.

[4] Newton points out: 'It is possible that there is no uniform motion by which time may have an exact measure. All motions can be accelerated and retarded, but the flow of absolute time cannot be changed. The duration or preservation of the existence of things is the same, whether their motions are rapid or slow or null, accordingly, duration is rightly distinguished from its sensible measures and is gathered from them by means of an astronomical equation.' See Newton, *Principia*, p. 410.

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unable to tell the exact time. In Newton's opinion, however, there must be an absolute punctual time, in spite of the difference between the indications of our watches.[5] Thus, the relationship between absolute time and relative time is akin to that between the Platonic idea and its corresponding physical object. For Plato, the object is brought into being by 'imitating' the idea but cannot achieve the latter's perfection; for Newton, thereby, relative time imitates absolute time but can never attain it perfectly. Like the Platonic idea, absolute time may only be realised and actualised by God:

> He is eternal and infinite . . . ; that is, his duration reaches from eternity to eternity; his presence from infinity to infinity. . . . He is not eternity and infinity, but eternal and infinite; he is not duration or space, but he endures and is present. He endures forever, and is everywhere present; and, by existing always and everywhere, he constitutes duration and space. Since every particle of space is always, and every indivisible moment of duration is everywhere, certainly the Maker and Lord of all things cannot be never and nowhere.[6]

Have either this remote God or cosmic time anything to do with our actual world? Achtner, Kunz and Walter give a positive answer:

> Absolute time was an implementation of its origin in the existence of the transcendent God. However, this invariably running time that was distant also had significance for our world, for it formed the time scale on which all natural laws run without change. In other words, absolute time was a projection of transcendent time onto the idealized, measurable, and objective time of science, that is, exogenous time.[7]

On closer examination we find that Newtonian absolute time is completely external and independent of the object world. Still, we cannot help asking: how can this transcendent time 'project' onto the time of science? Do not we need any media between the absolute time and actual scientific time? In this sense, Hodgson regards the Newtonian definition of absolute time as 'metaphysical'.[8] The 'flow' of time is stable, even and unchanged, within

[5] As J. R. Lucas puts it: 'time is not what the clocks say, but what they are trying to tell'. See Lucas, *A Treatise on Time and Space* (London: Methuen & Co., 1973), p. 64.

[6] Newton, *Principia*, p. 941.

[7] Achtner et al., *Dimensions of Time*, p. 113.

[8] 'These definitions are metaphysical', Hodgson argues, 'so that it makes sense to speak of doubling the speed of clocks or enlarging space. Without the concept of metaphysical time as an ultimate reference this would have no meaning, and similarly for space. Such definitions need to be supplemented by more physical definitions if they are to be of practical use. Absolute space can be defined physically as the unique reference

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such a metaphysical world. The laws of nature do not vary with time, and neither present, nor past and future have any priority within the Newtonian paradigm. Furthermore, by positing time as a cosmic background, Newton empties his absolute time, paradoxically, into a kind of timeless time or atemporal time.

Einstein's theory of relativity and time

The Newtonian theory implies that there is an absolute, dominant point from which the universe can be observed, i.e. a God's-eye view. Albert Einstein argues for the opposite: there can be no vantage perspective, for all observers, handicapped in their own local reference frames, are equal.[9]

In 1905, when Einstein introduced the Special Theory of Relativity (STR or SR), he substantively broadened the understanding of space and time. What Einstein did was to force physicists to think no longer of space and time but rather to look at a four-dimensional space-time.[10] In such a space-time continuum, the velocity of light is assumed to remain constant, namely 299,792,458 metres per second,[11] whereas time varies – the faster an object increases in speed, the more time slows down in that inertial

frame that, if it exists, can be recognized as such by all observers irrespective of their velocities with respect to that frame. Absolute time can be defined in a similar way.' See Hodgson, 'Relativity and Religion', p. 397.

[9] 'What Einstein did', Craig points out, 'in fact, was to shave away Newton's absolute time and space, and along with them the aether, thus leaving behind only their empirical measures. Since these are relativized to inertial frames, one ends up with the relativity of simultaneity and of length.' See William Lane Craig, *Time and Eternity* (Wheaton, IL: Crossway Books, 2001), p. 47. For the philosophical and theological significance of Albert Einstein's Special Theory of Relativity and General Theory of Relativity, see Ian G. Barbour, *Religion and Science* (London: SCM Press, 1998), pp. 177–81; Craig, 'The Special Theory of Relativity and Theories of Divine Eternity', *Faith and Philosophy* 11/1 (Jan. 1994), pp. 19–37; Craig, 'Relativity and the "Elimination" of Absolute Time', in Peter Øhrstrøm (ed.), *Time, Reality, and Transcendence in Rational Perspective* (Aalborg: Aalborg University Press, 2002), pp. 91–128; Garrett J. DeWeese, *God and the Nature of Time* (Aldershot: Ashgate, 2004), pp. 65–84; Lawrence W. Fagg, *The Becoming of Time* (Atlanta, GA: Scholars Press, 1995), pp. 29–42; Hodgson, 'Relativity and Religion', pp. 393–409; Robert John Russell, 'Time in Eternity: Special Relativity and Eschatology', *Dialogue: A Journal of Theology* 39/1 (2000), pp. 46–55; Roberto Torretti, 'On Relativity, Time Reckoning and the Topology of Time Series', in Jeremy Butterfield (ed.), *The Arguments of Time* (New York: OUP, 1999), pp. 65–82.

[10] Cf. Achtner et al., *Dimensions of Time*, p. 124.

[11] Torretti, 'On Relativity', p. 71. Of course, here a 'second' is a second within our earthly inertial frame where 'one second is no longer defined to be 1/86400 of a day: it is 9,192,631,770 beats of a cesium atom'. See Paul Davies, *About Time* (New York: Touchstone, 1996), p. 22. People changed the definition of second with the latter, presumably the cesium atom clock is more accurate, 'but accurate relative to what?'

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frame. Compared with the STR, the General Theory of Relativity (GTR or GR), which Einstein completed in 1915, takes into account the effects of acceleration and gravity. In a strong field of gravity, the time-space itself is curved rather than flat (like the time-space described in STR), thus the scale of time is influenced by gravity: in a strong field of gravity time appears to pass more slowly than in a weak field.[12]

Since what the GTR confirms, as far as time is concerned, is the similarity of effect caused by a gravitational field with that caused by accelerated motion in STR,[13] we may focus on the STR. According to the STR, an event which is present for an observer in one inertial frame may be future or past for another one in another inertial frame. Furthermore, none of these perspectives is privileged and there is, consequently, no absolute 'now' in the universe.[14] Whereas Augustine might be irritated by the negation of an absolute 'now', Boethius would be angry with the consequent deduction of this negation: the negation of absolute simultaneity, that is, any simultaneity is relative to a reference frame. For example, from our human point of view, no event is happening 'now' in an absolute sense on the planet Mars. However, that is not to say that the Newtonian absolute time is invalid. Although the STR excludes absolute simultaneity, it does allow temporal and relative simultaneity;[15] although the STR does not need a privileged and absolute reference frame, neither does it negate such a frame. The only problem is that we need to choose between Newton's metaphysics and Einstein's positivism or, more exactly, Einstein's Machian positivism. Whatever we

Davies asked (p. 22). Indeed, without a Newtonian absolute time, it is difficult to say one measurement of time is more accurate than another.

[12] Cf. Achtner et al., *Dimensions of Time*, p. 126; Fagg, *Becoming of Time*, p. 36.

[13] Cf. Barbour, *Religion and Science*, p. 179.

[14] Robert John Russell calls it the 'downfall of the present': 'There is no physically significant way of determining a universally agreed upon present according to SR. The inevitable implication is that there is no universal, unique "present"—only "present" defined by each moving observer in an equivalent way. SR invites us to look at the union of space and time in "spacetime".' See Russell, 'Time in Eternity', p. 50.

[15] 'The dependence of time', Hodgson argues, 'on the spatial coordinates and on the relative velocity of the two frames implies that the absolute simultaneity of events cannot be established. This does not imply, however, that temporal simultaneity has been disproved, since it does not exclude the possibility that absolute space and time can be established in some other way, as may be possible in the context of the Big Bang theory.' See Hodgson, 'Relativity and Religion', p. 403; Barbour puts it in a simpler way: 'Different observers "project" spatial and temporal dimensions of the four-dimensional spatiotemporal interval in different ways, but each can calculate what the other will be observing. There are rules for translating into equivalent relationships in another frame of reference'. See Barbour, *Religion and Science*, p. 178.

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choose, Einstein's positivism by no means can prove that Newton erred, e.g. in holding that God could see the world from a privileged perspective.

What impact does STR have on our understanding of divine eternity? In a space-time continuum, since each event possesses a static four-dimensional place, time appears to be more space-like than temporal.[16] Further, by negation of a privileged reference-frame and absolute simultaneity there is no universal present by which God can divide past and future.[17] Thus Craig argues that 'Contemporary analyses of divine eternity often make explicit appeal to physical theory, and particularly to the Special Theory of Relativity, in support of the doctrine of divine timelessness.'[18] He summarises the reasoning for divine timelessness as follows:

1. STR is correct in its description of time.
2. If STR is correct in its description of time, then if God is temporal, He exists in either the time associated with a single inertial frame or the times associated with a plurality of inertial frames.
3. Therefore, if God is temporal, He exists in either the time associated with a single inertial frame or the times associated with a plurality of inertial frames.
4. God does not exist in either the time associated with a single inertial frame or the times associated with a plurality of inertial frame.
5. Therefore, God is not temporal.[19]

As stated above, premise (1) maybe is correct, but it is not exhaustive. That is, if the correctness of STR does not negate the validity of Newtonian absolute time, then premises (2) and (3) are invalid. Craig also argues that GTR does imply, not without controversy, the existence of a cosmic time which can serve as the absolute measurement of God's absolute time.[20]

[16] 'We can draw graphs showing time as if it were another spatial dimension. It is sometimes said that we can present the cosmos as a static spatiotemporal block that different observers "project" as spatial and temporal dimensions in differing ways.' See Barbour, *Religion and Science*, p. 179. Cf. Stephen Hawking, *A Brief History of Time: From the Big Bang to Black Holes* (New York: Bantam Books, 1998), pp. 21–2; Christoph Lameter, *Divine Action in the Framework of Scientific Thinking: From Quantum Theory to Divine Action* (La Grange, IL: Christianity in 21st Century, 2005), p. 47.

[17] Cf. Charles Hartshorne, *A Natural Theology for our Time* (La Salle, IL: Open Court, 1967), p. 93.

[18] Craig, 'Relativity and Divine Eternity', p. 19.

[19] Craig, *Time and Eternity*, p. 44. An example of such reasoning can be found in Joshua M. Mosersky, 'Time, Tense and Special Relativity', *International Studies in the Philosophy of Science* 14/3 (2000), pp. 221–36.

[20] 'Relativity Theory', he argues, 'does not provide good grounds for thinking that God is timeless. The Einsteinian interpretation of STR is based essentially upon an untenable

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Instead of regarding the four-dimensional continuum described by the STR as the physical reality, Craig prefers an instrumental approach to interpret it.[21] The STR is a useful tool, however by no means does it forbid us to see time from an absolute perspective.

Indeed, Craig rejects STR in order to defend God's temporality. Only when there is a privileged reference frame and hence absolute time, can time be divided into past, present and future. In such a tensed time, God is simultaneous with our present only, thus God is temporal; if there is no division of time, God is simultaneous with all time, thus God is atemporal. Craig's stand is called, after Augustine and Scotus, 'presentism' by some authors.[22] The critical issue in Craig's argument is whether there is a privileged reference frame or not. However such a judgement can neither be proved nor refuted, thus the consequent debate between the temporal and atemporal interpretations of the STR still remains open.

Thus, we cannot help asking these two related questions. Has modern physics changed our opinions about time and God's eternity? If affirmative, has it changed them substantially? These questions appear far from settled. When we discuss our topic in the light of modern physical theories, the problem we have met is not: what do these theories mean to theology? It is rather this: what do these theories mean to themselves? That is to say, we cannot draw some certain conclusions from physics and then apply them to theology. There are two reasons forbidding us from doing so. First, physical theories need to be interpreted and there is no easy agreement between physical schools; second, to some extent, our approach to the physical theories decides our result. As in quantum mechanics, the way we watch decides what we watch, so, if we see eternity from a Newtonian

and obsolete verificationist epistemology and so cannot force abandonment of the classical concept of time. Moreover, GTR in its cosmological application furnishes us with a cosmic time parameter which may be plausibly interpreted as the appropriate measure of God's time since the moment of creation. The past finitude of cosmic time does not imply the finitude of God's time, for whether one adopts a substantial or a relational view of time, it is coherent to speak of God's existing temporally prior to the creation of the universe and the beginning of cosmic time'. See Craig, *Time and Eternity*, p. 66.

[21] Cf. Craig, *Time and Eternity*, p. 180.

[22] 'Scotus argued that,' Leftow points out, 'if events are not yet present time, they are not yet present to God in eternity. William Lane Craig, Bowman Clarke, Richard Creel, and Delmas Lewis have in effect revived Scotus' argument. They contend that if it is now true to say that events exist in eternity, it is also now true to say that these events exist in time.' See Leftow, *Time and Eternity*, pp. 230–1; Cf. also Michael C. Rea, 'Four-Dimensionalism', in Michael J. Loux and Dean W. Zimmerman (eds), *The Oxford Handbook of Metaphysics* (New York: OUP, 2003), pp. 174–6.

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perspective, we get a temporal and dynamic picture; however, if we see it from a Mach-Einsteinian perspective, we get a timeless and static view. And there is no decisive standard by which we can favour one and discard the other.

Barth's trinitarian temporality and eternity in *Church Dogmatics*[23]

In *CD* I/1,[24] Barth treats the dogma of trinity as part of the doctrine of revelation. According to Barth, there is no hidden God behind the triune God manifested to us in the scripture: the triune God is the revealed God and vice versa. God's self-revelation is God's word, and God's word is God's only-begotten Son – Jesus Christ God the Son. However, in *CD* I/1, whilst Barth uses the adjective 'eternal' in all three titles of the three persons of Godhead – the Eternal Father, the Eternal Son and the Eternal Spirit – the relationship between eternity and three persons of triune God is formal rather than substantial. We cannot find any detailed discussions of God's eternity or eternal God in that part. That is perhaps also the reason why we cannot find the subject 'Eternity' in the index of the English translation of *CD* I/1. However, by close study of the doctrine of time and eternity in the whole range of *CD*, we see that each mode of the triune God has a pre-, supra- and post-time structure and in each dimension of this temporal structure, the triune God reveals and relates himself to us concretely.[25]

For Barth, the Father is coeternal with the Son and the Holy Spirit. The eternal immanent Trinity acts concretely as the temporal economic Trinity, thus the triune God is pre-, supra- and post- to us. From an eternal point of view, God's temporality has a threefold structure. First, God is pre-temporal. Barth does not shy away from the question of 'What was God doing before

[23] The historical development of Barth's understanding of the concept of time and eternity from *The Epistle to the Romans*, *The Göttingen Dogmatics*, *The Resurrection of the Dead* to *Church Dogmatics* is too complicated to retrieve here.

[24] Karl Barth, *Church Dogmatics*, 13 part volumes, ed. G. W. Bromiley and T. F. Torrance (Edinburgh: T & T Clark, 1956–75). Referred to hereafter as *CD*.

[25] On the relationship between the holy Trinity and God's threefold temporality, Russell comments: 'Barth claims that eternity has a threefold character: as pre-temporal it is the source of time; as supra-temporal the divine life is related to all created moments as the principle of their unity; as post-temporal God is the goal of creaturely time lying beyond the end time. Thus the eternity of God embodies the intrinsic structure of time, namely succession without corruption. Finally Barth understood both the unity and the direction of time to be intimately related to the inner life of the Trinity.' See Robert John Russell, 'Is Nature Creation? Philosophical and Theological Implications of Physics and Cosmology from a Trinitarian Perspective', in Niels Henrik Gregersen, Michael W. S. Parsons and Christoph Wassermann (eds), *The Concept of Nature in Science and Theology* (Geneva: Labor et Fides, 1997), p. 103.

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He created the world?' and he, like Augustine, does not give a teasing answer such as 'He was preparing a hell for people who pry into mysteries.'[26] He also answers that question positively: 'God decided to call into being the world and man by His Word',[27] and his Word is Jesus Christ. Even before the creation, Jesus the Son was with God the Father. The Holy Spirit is also the eternal Creator who creates time for us with the Father and the Son.

Second, God is supra-temporal. 'Supra' here does not mean separation or transcendence. On the contrary, it has an immanent sense: the eternal God preserves our temporality as our covenant-partner in our time. From our point of view, time is separated from its own beginning and end, but time cannot be separated from eternity.[28] The touching point here, once again, is Jesus Christ. Among the three persons in eternal Trinity only the second person comes into our time *personally*.[29] In the Son, eternity and temporality become one in its ultimate form. However, even in his incarnation, the Son never separates himself from the Father and the Holy Spirit.

The third dimension of God's time is God's post-temporality. God the Father is the final goal of the creation. All our roads must lead to his eternity, otherwise they can only lead to nothingness and thus they are not the real roads at all.[30] Beyond eternity there is nothing: God alone will exist after all things. God will look back and judge everything that has happened in the universe. According to his will, everything in time will be decided finally without any appeal, but at the same time, everything will be fulfilled as well by the Son and the Holy Spirit. What is revealed to us in time is veiled, but in God's post-temporal eternity, we shall see it clearly without a veil. In this sense, Barth quotes 1 Corinthians 15:28, God will be 'all in all'.[31]

From eternity, the Father enters time itself in the Son and Holy Spirit to reconcile and redeem his creatures. The eternal Son enters time out of the Father's free self-giving love, dies for us on the cross and is resurrected in the Easter event, thus reconciling the fallen humans into the triune God himself.

[26] Augustine, *Confessions* 11.12, trans. R. S. Pine-Coffin (London: Penguin Books, 1961), p. 262.

[27] *CD* II/1, p. 622.

[28] For Barth, eternity is always real duration. There is no difference between beginning, middle and end. When time is related to eternity, it is not separated from its beginning and end.

[29] As Hunsinger puts it: 'When God humbles himself in Jesus Christ by entering time, he becomes one of us, like us in all things'. See Hunsinger, '*Mysterium Trinitatis*: Karl Barth's Conception of Eternity', in *Disruptive Grace: Studies in Theology of Karl Barth* (Grand Rapids, MI: Eerdmans, 2000), p. 203.

[30] Cf. *CD* II/1, p. 629, also R. Dale Dawson, *The Resurrection in Karl Barth* (Aldershot: Ashgate, 2007), p. 38.

[31] See *CD* II/1, p. 630.

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The eternal Holy Spirit proceeds from the Father and the Son, keeps on doing the Son's reconciling work in the time between the first and second *parousia*, and brings the eschatological promise to us here and now. Finally, at the end of the salvation history, the Son and the Holy Spirit come back to the Father, together with us as the triune God's reconciled and redeemed children. For Barth, creation, salvation history and eschatology are one. They tell the same story from different angles. Borrowing Hunsinger's term, we can say that these are a 'single event in multiform'.[32]

To sum up the relationship between time and eternity, we may start from two endorsements made by Barth: (1) 'Eternity is God himself';[33] (2a) 'Time is the form of the created world';[34] (2b) 'Humanity is temporality. Temporality, as far as our observation and understanding go, is humanity'.[35] The eternal God does not live timelessly. He is temporal because his eternity is authentic temporality, and therefore the source of time. However, God's temporality is different from human temporality for in God's eternity, present, past and future, are not successive, but simultaneous. The scriptures appear to identify a God in time, yet a God who is somehow beyond time, not constrained by it the way we are. Humans live in time created by God, in the temporal succession of past, present and future, whereas God's eternity is the simultaneity of all time, as Gunton puts it: 'There is a kind of temporality in God, which preserves both the ontological distinction of God from the world and the real relation God has with it. God's eternity is not non-temporality, but the eternity of the triune *life*.'[36] That is to say, eternity is both transcendent and immanent to time. Under such a premise, time must be understood in light of eternity and not vice versa, for creaturely existence is derived from the Creator and not vice versa. Such a relationship should not be understood in an abstract philosophical way, for the eternal God, according to Barth, approaches time in a concrete trinitarian way.

What can Barth say to Newton and Einstein on the issue of time?

When we reflect on Barth's contribution to any scientific understanding of time, we must not pretend that Barth's doctrine of time and eternity is a 'theory of everything'. On the contrary, some weaknesses could be detected in Barth in light of Einsteinian relative time. First, Barth rarely

[32] Cf. George Hunsinger, 'The Mediator of Communion: Karl Barth's Doctrine of the Holy Spirit', in *Disruptive Grace*, pp. 173–9.
[33] *CD* III/2, p. 526.
[34] *CD* III/2, p. 438.
[35] *CD* III/2, p. 522.
[36] Colin Gunton, 'Barth, the Trinity, and Human Freedom', *Theology Today* 43/3 (1986), p. 318.

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troubles himself with the nature of time itself. Since time can be only defined according to God's eternity, there is no such notion as 'time in itself' and thus there is no theological means of studying the nature of time itself.[37] Second, Barth mainly confines time within human history or individual life span; his illustration and usage of 'time' might be sufficient for a theological anthropology, however some important topics, such as 'the time of universe', 'relationship between time and movement', which are usually reflected and studied under the conception of time, seldom find a place in Barth's doctrine. Although Barth may defend himself by claiming that 'I am a theologian, not a philosopher or scientist', we do not have to confine our study within the traditional theological area. On the other hand, what we say above does not mean that Barth cannot make a contribution to a religion–science conversation. If we keep in mind that our effort in bringing Barth into such a conversation remains tentative, perhaps we may gain some new perspectives on the relationship of time and eternity.

Let us initiate this conversation by engaging Barth with Newton and Einstein. When we look at Newtonian time and space or Einsteinian space-time, once again, we meet with the temporal-atemporal dilemma in a cosmic background. If we see eternity from a Newtonian perspective, we get a temporal and dynamic picture; if we see it from an Einsteinian perspective, we get a timeless and static view. However, these simplified perspectives cannot exhaust God's eternity. On the contrary, they are transcended by God's trinitarian temporality.

From Barth's relational point of view, the Newtonian notion of absolute time is no more than an empty speculative concept. No time by itself could be absolute because there is no time at all apart from God's eternity.[38] Had the Newtonian temporal container been really absolute, God would have to be subject to it as well since he has nowhere else to act. If time, as defined by Barth, is created and given by God, the sovereignty and freedom of God would not be offended. Throughout Barth's works, God's priority is always his first concern. In the doctrine of time and eternity this is also the case. Then, if our time or universal time is not absolute, how about God's eternity? Whether it is absolute or not? Barth would admit eternity as absolute in the sense of infinite, but not in the sense of isolation, i.e. there is no limit to God's temporality

[37] Cf. Wolfhart Pannenberg, *Systematic Theology*, vol. 1, trans. Geoffrey W. Bromiley (Grand Rapids, MI: Eerdmans, 1991), pp. 405–7.

[38] For Barth, Busch says, 'the mistake in the concept of time that was dominant in the intellectual world around him was to think of time as "absolute time," the "absolute reality," "the naked structure of the sphere" to which we belong'. See Busch, *Great Passion*, p. 264.

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and God never chooses to live without us.[39] In other words, Newtonian absolute time is something too transcendental and too ideal, so it is too difficult to understand how it could be related to our concrete time. Thus, although Newton holds to the opinion that absolute time is temporal and dynamic, actually he has to share the same difficulty with those who advocate an atemporal God. When we turn to the Barthian approach, by emphasising both transcendental and immanent relationship between eternity and time, the Newtonian difficulty disappears in this trinitarian perspective. On the one hand, the triune Creator in eternity transcends his creature and its creaturely form – time absolutely. On the other hand, even when the eternal triune God enters our time – a Newtonian temporal container in this sense – and moves together with the time 'uniformly' in the Son and the Holy Spirit, he takes time to his own eternity, which does not mean that he is conditioned by time.

In Einstein's theory of relativity, time is intrinsic to the speed of movement and relative to the reference system. The crucial distinction between Newtonian time and Einsteinian time lies in the question: is there a privileged reference system? If there is one, we can maintain the notion of Newtonian absolute time; if there is no such system, we must choose Einsteinian relative time.[40] According to Barth, the perspective of the triune God might be such a privileged system since time, energy, movement are all created by God. Whatever the speed of a moving body is, whichever reference system it locates, it is absolute simultaneous with God's eternity.[41] In his eternity the transcendent God simultaneously possesses all time.

The triune God does not only transcend time by his absolute simultaneity with all time, he also provides something which is lacking in Einstein's theory of relativity. In an Einsteinian fixed block universe the complete history of the universe is depicted. Every event in this four-dimensional entity is posited as a space-time slice, thus there is no ontological difference between them

[39] According to Busch, the concept of 'absolute time' is rooted theologically in an 'absolute' eternity, eternity cut loose from creaturely time. Cf. Busch, *Great Passion*, p. 268.

[40] Lucas thus argues: 'Einstein formulated the principle that there are no privileged observers and elevated it from a truth about electromagnetism to a general metaphysical principle; whereas Newton, more cautiously, did not.' See John Lucas, 'The Special Theory and Absolute Simultaneity', in William Lane Craig and Quentin Smith (eds), *Einstein, Relativity and Absolute Simultaneity* (London and New York: Routledge, 2008), p. 280.

[41] For the defence of 'absolute simultaneity' which Einstein excludes from his Special Theory of Relativity, cf. Michael Tooley, 'A Defense of Absolute Simultaneity', in Craig and Smith, *Einstein, Relativity and Absolute Simultaneity*, pp. 229–43; Richard Swinburne, 'Cosmic Simultaneity', ibid., pp. 244–61.

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at all. Since all events are independent and there is no communion among them, continuity and becoming are undercut, that is, there is no distinction between past, present and future. This position is famously illustrated by Weyl: 'The objective world simply *is*, it does not happen. Only to the gaze of my consciousness, crawling upward along the lifeline of my body, does a section of this world come to life as a fleeting image in space which continually changes in time.'[42] Furthermore, the Einstein equations are time-reversible, hence there is nothing special at any particular time.[43] In other words, there is no unique direction in time: whether we travel from past to future or from future to past does not make any difference in the Einsteinian universe.

In Barth's trinitarian opinion, all the events in history could not be equally present in God's eternity. Such events as the creation of heavens and earth, the Easter event and the Pentecostal experience etc. are ontologically superior to other ordinary events in human history because they do change our temporality. Such historic events make a historic man – Jesus Christ – become the contemporary of all events in the fixed space-time continuum. Further, this temporal simultaneity does not undermine the direction of time. On the contrary, it offers one. From an eternal perspective, salvation history is far from time-reversible for each event posits in its particular temporal order, that is, some events really become past and some really come from future. Sustained by the trinitarian eternity, those discrete space-time slices become communicable and hence take genuine temporal characteristics, i.e. the past, present and future. For the possible contribution which a trinitarian eternity could make for Einstein's theory of relativity, Russell has an illuminating discussion, albeit a little bit abstract in appearance. Bearing Barth in mind, Russell argues thus:

> Succession in eternity entails not only maintaining the distinction between events, as found in relativity, but maintaining a unique causal order between all events, and for a given event P this is found only within the lightcone of events surrounding P. Eternity also entails a unique orientation between causally ordered events, whereas in spacetime there are two possible orderings among causal events. Finally succession in eternity is coupled with incorruption. This is similar to the equivalent ontological status of all events in spacetime. If, therefore, we want to

[42] Hermann Weyl, *Philosophy of Mathematics and Natural Science* (Princeton, NJ: Princeton University Press, 1949), p. 116.

[43] Cf. George F. R. Ellis, 'Physics in the Real Universe: Time and Space-Time', in Vesselin Petkov (ed.), *Relativity and the Dimensionality of the World* (Dordrecht: Springer, 2007), p. 50.

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> speak theologically about eternity as the source and completion of time as understood by relativity theory, then eternity gives to all events a complete causal ordering and a unique direction (Alpha to Omega), both of which are lacking in nature at least at the physical level, according to relativity.[44]

In conclusion, Barth's trinitarian doctrine of time and eternity may also shed some light on our scientific knowledge of time. The triune God's eternity excludes both Newtonian absolute-time and Einsteinian timeless-block universe. In pre-, supra- and post-temporality, the Father, Son and Holy Spirit transcend time concretely in our history and penetrate time absolutely from divine eternity. This trinitarian transcend-immanent temporality may smooth over the atemporal character in both Newtonian and Einsteinian perspectives of time, since the eternal triune God is temporal; also the person and activities of the Son and the Holy Spirit in human history can provide the missing links in those two approaches: in Newton's case, it is the media between absolute time and actual historical or scientific time; in Einstein's case, it is the direction of time from the past to the future.

[44] Russell, 'Is Nature Creation?', p. 104.

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