THEOLOGY AND COSMOLOGY: A CALL FOR INTERDISCIPLINARY ENRICHMENT

by Raymond R. Hausoul

Abstract. Today, there is a growing interest in interdisciplinary studies between theology and natural sciences. This article will reveal some "core" problems in this interdisciplinary relationship. It investigates how cosmic eschatology and natural sciences can benefit the most from each other while dealing with the scenarios which cosmology presents. Doing so, the main emphasis will be on rediscovering the impact of the Resurrection in Christian theology and the possibility of launching a dialogue between natural sciences and theology concerning the new heaven and the new earth.

Keywords: cosmology; natural sciences; new creation; new heaven and earth

Alienation between Theology and Cosmology

During the past few centuries, a long-standing division between faith and natural science has resulted in Christian eschatology focusing only on so-called individual eschatology. Central herein was the future of each individual human being. Theological questions arose, such as what is death and what are the effects? Is there life after death? Is there purgatory, heaven, and hell? Is there a resurrection of the body?

Questions about the future of the cosmos, which belonged to cosmic eschatology, were hardly ever discussed. An important question such as what future is there for this creation? was not heard. The future of the cosmos was neglected in the Christian doctrine (Rahner 1967, 1:1185; Moltmann 1987, 837; Bachl 1999, 1:18; Remenyi 2005, 419; Remenyi 2007, 184; van den Brink and van der Kooi 2012, 639). The future of the cosmos stood in the shadow of the individual's anthropocentric interest. Therefore, questions about the future of the cosmos were left to the fields of cosmology, astrophysics, and other natural sciences. We can still see

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this separation in the *Church Dogmatics* of the Swiss theologian Karl Barth (1886–1968): "There is free scope for natural science beyond what theology describes as the work of the Creator. And, theology can and must move freely where science . . . has its appointed limit" (Barth 1945, x).

This division between theology and natural sciences has a long history behind it, and there were often major tensions between natural sciences, albeit at a preliminary stage, and Christian theology. The rise of the philosophy of the Enlightenment strongly contributed to this division, arguably more than science. From that perspective, it was commonly assumed that theology was mainly focused on the meaning of life and on the relationship between God and humanity, while the natural sciences had to deal with the laws of material existence. The outcome of these differences only increased the gap between both disciplines.

In the past decades, theology has rediscovered the field of cosmic eschatology. However, there remains a tangible disconnection from the natural sciences. For example, the German philosopher and theologian Klaus P. Fischer (b. 1942) writes in his monograph *Kosmos und Weltende* that scientific research into cosmology is of secondary importance concerning a biblical Christian eschatology. His line of reasoning is that both disciplines examine different subject areas and are doing this from various perspectives (Fischer 2001, 53; see also Tanner 2000, 222–37). However, these are debatable assumptions. Those who proclaim that the prospect of Christian cosmic eschatology is an entirely different creation from the current one give cause for a persistent breach between theology and natural science. In that case, eschatology expresses itself in terms of absolute discontinuity—which will evoke critical questions from many theologians. Fischer's other argument is that both fields study reality from different perspectives. However, this is not a valid reason to avoid an interdisciplinary conversation between both disciplines. The different views offer possibilities to enrich and challenge each other in mutual reflection on the future of the cosmos.

Recognition for a Dialogue

Anyone who rejects absolute discontinuity between this creation and the new creation and leaves openness for a particular form of continuity has to recognize that there is much common ground between theological and physical sciences. This new creation then stands in relationship with the creation we face today. This does not mean that a Christian-eschatological cosmology would be a replacement for an empirical cosmology or vice versa. Every branch of science will be held accountable. In Christian theology, this requires responsive reflections of the Biblical confession of hope. Christian faith in God's promises chooses to confess God as Creator and Redeemer of this creation. However, Christian eschatology refers to the future and

professes the same reality that natural science is currently investigating. Therefore, alienation between the discipline of theology and other scientific fields should be avoided.

Because of the growing interest in the theme of the new heaven and the new earth, theologians today recognize more than ever that theology and natural science should not be disaggregated (see, for example, Müller 2004; Peters et al. 2006; Russell 2008a, 563–80; Pannenberg 2010; Polkinghorne 2011; McNamara and Wildman 2012a, 2012b, 2012c). In the interdisciplinary dialogue, both are needed. Here, we realize that all sciences, including theology, (astro)physics, cosmology, biology, chemistry, and any other science, are potentially limited.[1] The universe with its interwoven structure of time, space, and matter is too complex to be contained in one science. We all regard reality from different perspectives with a variety of presuppositions. Therefore, dialogue and cross-fertilization between various natural sciences and theology should offer an advantage for both fields of research. From this mutual coherence, the German systematic theologian Wolfhart Pannenberg (1928–2014) pleaded for a growing convergence between both fields (Pannenberg 2004, 118–19; Pannenberg 2010, 26–27). According to the British theologian and astrophysicist David Wilkinson (b. 1963), a dialogue between the natural sciences and the discipline of theology can lead to great enrichment. This could result in various vital consequences for both sciences (Wilkinson 2010, 95–116). The well-known Tübingen systematic theologian Jürgen Moltmann (b. 1926) also acknowledges in his reflection on the new creation that a dialogue is possible between the natural sciences and the field of theology in eschatological proposals about time and space. This dialogue may lead the natural sciences to convey more about God and to be able to communicate more about nature to theology (Moltmann 1999, 68–84). This could then lead to new scientific proposals and research questions which are useful for both disciplines, as proposed by Robert John Russell (2012).

Creation Doomed to Die

The English physicist and theologian John C. Polkinghorne (b. 1930) supports the idea of developing a dialogue between the field of theology and that of natural sciences. From his scientific experiences with both disciplines, he chooses to emphasize a harmonious consonance between theology and natural science (Steinke 2006, 57–82; examples include Polkinghorne and Welker 2000; Polkinghorne 2002a; 2002b; 2011, 26–115; see also Barbour 2000, 7–38; Tanner 2000, 222–37; Dürr 2004, 11–158; Wilkinson 2010, 7–22). This consonance can be found partly in the shared awareness of both disciplines that not only human life is mortal and finite at this time, but also that future life in the universe is doomed if no intervention takes place.

Whoever investigates the universe recognizes its future state from cosmology. Until the end of the twentieth century, scientists referred to two core options when asked about this. In one case, the cosmos decelerates exponentially, the expansion of the universe finally comes to a standstill, and the universe collapses through contraction. This would result in a so-called *Big Crunch*, the reverse of a *Big Bang*. The second core option was that the universe would continue to cool down to the maximum cooled status of 0° Kelvin, due to further expansion. That would be a so-called *Big Chill* or *Big Freeze*; in both cases life would no longer be possible.

These hypotheses were changed after scientific research discovered that the universe was not slowing down, but accelerating. The cause of this was to be explained by stipulating the existence of "dark energy" not yet empirically discovered. If the universe continued to expand rapidly, it would eventually lead to all elements being pulled apart. That would produce a so-called *Big Rip*.

In all the final scenarios which scientific cosmology currently has to offer, there is a radical bankruptcy of any evolutionary optimism. To put it in the favorite terms of Jürgen Moltmann: for the future, nothing can be expected from creation itself (*futurum*). The eternal future of this creation is only possible because God comes to this creation (*advent*; Hausoul 2018, 141–42). Also, Polkinghorne correctly states that "the universe is condemned to ultimate futility, and humanity wants to have a transient episode in its history" (Polkinghorne 1994a, 162; see also Russell 2008a, 565; Russell 2012).

Theologically, the aforementioned final scenarios evoke all kinds of Bible texts that speak of the sun that is being darkened, the moon that loses its luster and the stars that fall from the sky when the heavenly powers are shaken (Joel 2:10; Matthew 24:29). These visionary metaphors are very remarkable from the contemporary scientific knowledge we have of our cosmos. However, how can Christian doctrine respond to these final scenarios?

Challenges for Christian Theology

Even though a meltdown or other life-threatening end of the cosmos is still far in the future, theology is currently seeking answers to the following questions: What is God's intention for this cosmos? What future does God promise this creation? The discipline of natural science is unable to respond to these questions. The natural scientist can stand in awe of the secrets of the cosmos—its structure, beauty, harmony, and dynamics. At the same time, the scientist recognizes the limits of his own discipline. When it comes to the future of the present universe, physics–empirical research only predicts scenarios of disaster.

The Christian natural scientist is challenged in the same way as the Christian theologian. It is known in Christian doctrine that God's promises often radically contradict what can be expected from creation. All miracles that

the ancient heroes of biblical faith experienced could not be extrapolated from daily life. It was all about new experiences whose sources could only be found in God. This calls on faith to put all expectations on God and to hold on to God in confidence, even if it radically contradicts the expectations in this world. The Resurrection of Jesus Christ, the anchor of Christian hope, makes this most visible. This is about the victory over death, which cannot be overcome by humanity itself (Moltmann 1964, 15–21).

The Christian feels this tension between the expected reality and the promises of God when it comes to the future of creation. Traditionally, Christian doctrine teaches about eternal life in God's Kingdom. Well-known are the prophetic words of John: "I saw a new heaven and a new earth" (Revelation 21:1), the liberating words of Paul: "creation itself will be set free from its bondage to corruption and obtain the freedom of the glory of the children of God" (Romans 8:21), and Peter's promise about the return of Christ and "the time of restoration of all the things about which God spoke by the mouth of his holy prophets long ago" (Acts 3:21).[2] In addition to the confession of the bodily resurrection of the individual believer, the old creed of Nicene-Constantinople mentions the hope of the new creation: "and life in the coming empire" (καὶ ζωὴν τοῦ μέλλοντος αἰῶνος; see for further effects in history McDannell and Lang 2001; McGrath 2003). This hope of a physical resurrection and an eschatological fulfillment and glorification of the cosmos in a new cosmos remains beyond the reach of our empirical methods in sciences. But a theology which is supported by hope can make an attempt in providing a contribution from human sciences. This can be done from its own perspective and from the same cosmic reality that the natural scientist investigates.

Anyone who holds on to any form of physical continuity between this creation and the new creation is challenged by the above-mentioned perception. If the cosmic expectations of current scientists become reality (Big Crunch, Big Chill or Big Rip), the continuity of this creation with the new creation would not be possible. If these final scenarios are correct, every hope of an eternal physical future for this creation is no more than vain talk (Tanner 2000, 222; Macquarrie 2003, 351–62). What often remains are conditions for heavenly nonmaterial spirits, like they were portrayed in ancient Greek sagas about Mount Olympus. The Biblical expectations that are presented in an earthly and concrete way would then only be feasible. God would have to create a new creation from nothing (*ex nihilo*), like this creation originated from nothing in Genesis 1.[3] In such an *ex nihilo* created new heaven and new earth, we should not expect "resurrected bodies." It would only contain "new bodies" (*ex nihilo*). The Biblical hope of resurrection and the statement that "creation itself will be set free from its bondage to corruption and obtain the freedom of the glory of the children of God" (Romans 8:21) would not happen. Earth would perish and receive no freedom of corruption or participation in the glory of the children of God.

If this were to happen, it must be said that the Son of God did not redeem *this* creation, as John 3:16 asserts. Salvation would then be limited to the redemption of humans from within this creation.

Often, critical reflections on the final scenarios from the field of the natural sciences have led humans toward a rejection of the ancient Biblical and Christian expectation of the future. From these observations, the Lutheran systematic theologian Ted Peters (b. 1941) notes: "We should have proof that our faith has been in vain. It would turn out that there is no God, at least not the God in whom followers of Jesus have put their faith" (Peters 1993, 175–76; see also Peters 2002, xiv).

An example of this can be found with the English Anglican theologian and biochemist Arthur R. Peacocke (1924–2006). He calls on natural sciences not to waste their time by engaging in a dialogue with theological reflections on the future: "All speculation on detailed scenarios of this consummation, the theological exercise called 'eschatology,' surely constitutes a supreme example of attempting to formulate a theory underdetermined by the facts. As such, it seems to me a fruitless and unnecessary exercise" (Peacocke 2001, 48).

According to Peacocke, Christian faith is about God and about the birth, Resurrection, and glorification of Jesus. Although Peacocke was a progressive leader in the interdisciplinary dialogue between theology and the natural sciences, he opted not to enter into detailed and extended dialogue concerning the relationship between eschatology and cosmology. Like the aforementioned Klaus Fischer, Peacocke chooses the proposition that theology and natural sciences speak of two different worlds. This kind of posture brings us back to the beginning of this article, in which no further thought is given to the possibility of an enriching dialogue between eschatology and scientific cosmology (Ellis 2002; Polkinghorne 2006, 144; Polkinghorne and Welker 2000; Russell 2008a, 563; Russell 2002, 3–7). The psychologist and theologian Fraser Watts (b. 1946) writes correctly, "It is probably the most challenging topic in theology and science" (Watts 2016, 144).

A Lack of Awareness of the Bodily Resurrection

Although dialogues between the natural sciences and theology have been taking place on an increasing scale for more than fifty years, there is comparatively little attention given to bodily resurrection (see Wilkinson 2010, 49). While Christians mostly believe in a certain form of resurrection, it is the confession of the bodily resurrection that often separates minds. So, it was after Paul's confession of the resurrection of the dead, "which was mocked by some. But others said, 'We will hear you again about this'" (Acts 17:32). But without a bodily resurrection, the physical part of God's creation would be seen as a temporary decor, without any additional future.

The Biblical testimony is opposed to that. Not only humanity, but all creation is precious in God's eyes and wanted by God. From the beginning, God has a higher purpose in mind and bears witness to a new heaven and a new earth. Nor does creation disappear forever in the future, just as, from the Biblical testimony of the resurrection, the human body does not disappear forever. The former Pope Benedict XVI, Joseph Ratzinger (b. 1927), typifies the extrabiblical thoughts as gnostic movements that radically deny God's creative work and go against all Biblical witness of creation (Ratzinger 2005, 96–97). Continuously, the followers of Jesus are adamantly observing that the heavenly Messiah became a physical human, died physically on the cross, and rose physically from the dead. Jesus did not have a false body, and the Resurrection of his physical body was acknowledged by many. "In Him the whole fullness of deity dwells bodily" (Colossians 2:9), it is stated, and "if there is no resurrection of the dead, then not even Christ has been raised. And if Christ has not been raised, then our preaching is in vain and your faith is in vain" (1 Corinthians 15:13–14).

The missing emphasis of the holistic physical resurrection in Christian doctrine gives reason to ignore the Biblical revelation of a renewal of the universe. Matthias Remenyi writes: "Usually it is rather the case that the hope for a new heaven and a new earth is rather a stepchild of the eschatological discussion" (Remenyi 2005, 419). But it is because of the Resurrection of Jesus Christ that eschatology dares to speak of the new creation in terms of both continuity and discontinuity as it is often stated in the already mentioned works of Polkinghorne and Russell.

At the same time, we must acknowledge that the natural sciences also rely (unconsciously) on various philosophical, metaphysical assumptions. These assumptions are subject to change (see for a critical reaction Nürnberger 2012, 972; a refutation of this can be found in Watts 2016, 139–52; Davies 2001). In the past, natural scientists often had difficulties recognizing this in their own field. However, for a long time, it has been recognized that physical views, such as those on the relationship between matter, space, and time, cannot be separated from underlying metaphysics (see Heller 2008, 238–78). The physicist, cosmologist, and astrobiologist Paul Davies (b. 1946) gave his praised introduction to cosmological research the apt subtitle *Speculating about the Fate of the Cosmos* (Davies 2001).

Today, experts from the natural sciences realize that their research is less "exact" than they declared it to be in the nineteenth century. After physics had its peak following the discovery of classical mechanics by the English physicist Isaac Newton (1643–1727), it was assumed that in a few years time there would be nothing more to discover. The world at that time was thought to be completely charted by the discoveries of natural sciences. That attitude would change because of the numerous discoveries of the

famous mathematician Albert Einstein (1879–1955). Einstein published over 300 scientific works and more than 150 nonscientific works (Schilpp 2000, 730–46). Further discoveries made it clear that natural science had certainly not mapped the cosmos sufficiently. This field of research faced great challenges and was confronted with laws that challenged each other. A well-known example is the relationship between the general theory of relativity and quantum physics. Despite the fact that both are valid, they are mutually exclusive. This is still the situation at the moment, although the natural sciences hold on to the belief that these two theories offer the best formulations about reality today. Also, science nowadays is still positively critical of its own explanations about the future of the universe. Like the theologian, the natural scientist knows the advantages and challenges of her or his field. Today, in our society, there is a strong encouragement to avoid isolation and work interdisciplinarily as a scientist (Moran 2010, 3–12, 188–92; Schmidt 2010; Repko et al. 2014, 3–22, 63–85; see also Kärkkäinen 2015, 123).

Reflections Concerning Resurrection

Theologians emphasized that all theological reflections on eschatology find their foundation in the confession of the Resurrection of Jesus Christ (Lindemann 2000, 343; Remenyi 2007, 90; Thiselton 2012, 12). Stimulated by this transcendent and immanent event from God's faithfulness as Creator and Saviour, it is possible to make statements about the future (O'Donovan 2001, 14, 31; Polkinghorne and Welker 2000, 12, 94–95; Clayton 2005, 128–49; Russell 2008a; Russell 2008b, 564; Russell 1984, 463). This includes the future of the cosmos. Based on the empty grave, Christian doctrine teaches that God is engaged in this creation and that death does not get the last word. In the gospels of the New Testament, the resurrection stories of Jesus Christ show that there is continuity between the present perishable body and the imperishable resurrection body (*ex-vetere*) as well as space for discontinuity, by speaking about a transformed glorified resurrection body (*theosis*; Russell 2008a, 573; Wilkinson 2010, 104; Hausoul 2018, 284–303). It is important to find a healthy balance between both continuity and discontinuity. Resurrection and glorification of the creation belong together in Christian confessions. Therefore, too much emphasis on the continuity between this creation and the new creation does not take the scientifically anticipated future of this creation seriously and has no eye for the theologically emphasized glorification of the new creation (Wilkinson 2010, 105). Placing too much emphasis on the discontinuity would hurt the theme of the resurrection seriously. It tends to turn the resurrection theory into a replacement theory (*ex nihilo*). However, in Biblical hope, both expectations are connected. The testimony of the resurrection shows God's "yes" for this creation, and from that historical experience allows us

to look forward to the new creation. So, the Resurrection of Jesus Christ is the first step of the new creation (Polkinghorne 1994b, 167; Wilkinson 2010, 106; Kim 2016, 157). Christ is the firstborn of the new creation, to which both the physical and the nonphysical belong. Jürgen Moltmann therefore correctly writes: "Because there is no such thing as a soul separate from the body, and no humanity detached from nature—from life, the earth and the cosmos—there is no redemption for human beings either without the redemption of nature. . . . Consequently it is impossible to conceive of any salvation for men and women without 'a new heaven and a new earth'" (Moltmann 1995, 286).

Also, Wilkinson believes from the Biblical testimonies that the new creation has its time and space. God does not leave creation behind in a timeless or spaceless way, "Talk of 'beyond space and time' is unhelpful and misleading" (Wilkinson 2010, 105). Wilkinson finds substantiation for this statement in the resurrection stories of Jesus Christ, all of which speak about space and time. After his Resurrection, Jesus spends several hours with the disciples. He eats and speaks and strengthens mutual relationships. All this happens in time, space, and matter.

Resurrection as Groundwork for an Open System

Based on the Christian faith in a bodily resurrection, it is possible that there is openness between theologians and physicists for a common dialogue (Wilkinson 2010, 107). The Resurrection testifies that creation is not a closed system that does not permit external anticipation. God can anticipate in this cosmos in a special way, as happened at the Resurrection of the Son, and nowadays through the innovative power of the Spirit. From the Resurrection of the Son, the renewal of the Spirit and eschatological speech, there is common ground on which the discipline of theology and that of the natural sciences can enrich each other in their professional reflections.

For the natural scientist, there is a parallel of this open system with what is established from quantum physics. In quantum mechanics, there is a fundamental limit to the precision with which certain pairs of physical properties of a complementary variables particle can be known. This quantum physical phenomenon is called Heisenberg's uncertainty principle. So, a mathematical quantum physical end result cannot be precisely calculated and thus forms an open system.

This understanding would permit questions of mutual interest to enter the dialogue between natural sciences and theology in a reflection on the new heaven and the new earth. Here are some of the questions that you can find in professional literature: Are there theological indications for new laws of nature that God is realizing in the new creation? (Wilkinson 2010, 51; Russell 2012, 51, 81, 181). For example, can we deduce "new" laws from the Biblical miracles? To what extent does general relativity, which relates

matter, space, and time in physics, remain in the theological speech about the new heaven and the new earth? (Polkinghorne 2006, 156; Polkinghorne and Welker 2000, 100, 117–20; Kim 2016, 159). To what extent is not matter but "information" the fundamental component of the universe? (Wheeler 1990, 309–36; Kauffman 2014). Where is a transformation of physical laws forced into the testimony of a new creation? (Murphy 2002, 202–18; Russell 2002, 3–30; Wilkinson 2010, 109). What ensures us that the cosmos with all its complex data, despite the already present "decay," will remain intact so that life is guaranteed? To what extent is there a metaphorical relationship between entropy and evil and between entropy and renewal? (Russell 2008b, 226–46; Russell 1984, 449–68; Nürnberger 2012, 970–96). Does the new creation also know the law of entropy and the second law of thermodynamics, or can these laws be lifted into a perfect creation? (Russell 2008b, 226–72; Wilkinson 2010, 113). If they are still present, can heavenly bodies, such as the sun or the stars, continue to convert energy into heat eternally without their energy source running out and do the elements also remain eternally, without decay in their core? When these laws are lifted, how can an abolition of such laws prevent the continuity between this creation and the new creation from being lost so that in Christian teaching there can only be a future creation *ex nihilo*? Does today's creation already contain physical conditions and characteristics that also remain in the new creation and may only need to be transformed along a continuum (so, no discontinuity)? These kinds of questions challenge the theological–cosmological reflection on the expectation of the new heaven and earth.

The dialogue between both disciplines can lead to a fruitful result in speaking about the current and the new creation based on these kinds of questions. In this relationship, there should be consonance and dissonance in the dialogue. From this perspective, Robert John Russell, the founder and director of the Center for Theology and Natural Sciences, writes "that theology can indeed offer creative suggestions in the form of questions, topics, or conceptions of nature which scientists might find helpful" (Russell 2012; Russell 2008b, 21; see also Kärkkäinen 2015, 28–29).

Both disciplines should not be isolated in their own research but may meet each other as equal partners in dialogue (Wilkinson 2010, 52). Theology must critically integrate scientific discoveries into its own reflection and challenge cosmology with its own questions about its (unconscious) philosophical presuppositions (Russell 2008a, 573). The extent to which these metaphysical presuppositions are even theological or anti-theological can then be discussed. For example, it may be questioned whether the laws of nature that it draws up are descriptive or prescriptive (Stoeger 1999, 207–35).

The natural sciences are, in turn, served if theology not only provides them with devotional publications on the new creation but also examines

this topic in academic reflections on the new heaven and the new earth. This kind of interdisciplinary dialogue will make it possible to provide a common theological-scientific contribution to the Christian hope for a new cosmos. Doing so, theology and science can actually advance to a point where the above-mentioned questions can be seriously tackled.

Notes

1. When we think of "sciences" we often think of traditional exact natural sciences that can measure, control, and prove content. From this description, theology can hardly be called "scientific." However, theology is part of the humanities, alongside classical languages, art sciences, psychology, sociology, and philosophy. These disciplines investigate contents that are not completely precise or unambiguous, but apply scientific research methods.
2. All biblical quotes are from the *English Standard Version* (ESV, 2016).
3. For example, we can find that expectation of a new creation *ex nihilo* in the Qur'an: "The day when we shall roll up the heavens as a recorder rolled up a written scroll. As we began the first creation, we shall repeat it. It is a promise upon us. Lo! We are to perform it" (Sura 21:104).

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