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MATTER MATTERS
THE ESCHATOLOGY OF MATTER

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Abstract

This article aims at exploring the future of matter with a view to provide an eschatological hope in the context of the scientific predictions of the cosmic futility. First we take into account the Omega Point theory of Teilhard de Chardin. In response to the most contemporary cosmological challenges to the future of matter we consider the 'physical eschatology' of Freeman Dyson and Frank J. Tipler. As they face criticism from Science, Philosophy and Theology, we move on to the perspectives of contemporary scientist theologians (John Polkinghorne, David Wilkinson, and Robert J. Russell) to understand the future of matter in new creation. While affirming the dynamic and self-transcendental nature of matter, the logical progress in their views intelligibly underlines the immanence of God in matter and enables us to appreciate the sacredness of matter in Christian theology. The method applied is the method of Theology of nature which derives the ultimate ground of hope from theological resources in dialogue with the Natural sciences.

Keywords: cosmology, co-presence, transmutation, transformation, omega point

1. Introduction

Contemporary science presents very reliable descriptions of catastrophic events that are capable of wiping out life in the Universe. According to various scientific models on the fate of the Universe, the final state is ‚freeze or fry or endless dying process'. In the context of the scientific predictions of cosmic futility what would be the future of matter? Can we hold an eschatological hope? It is said in general that the Semitic religions are mainly God-human centred; very often the Cosmos is sidelined, consequently matter too. In the Christian Scripture we find examples where the world is considered evil and therefore to be denied (1John 2.15-16). The dualistic impact of the philosophy of Plato, Aristotle, Thomas Aquinas and Descartes that subdued matter is still prevalent in Christian theology (e.g. the soul language and matter-spirit dualism in Theology). In this article I make an attempt to explore the eschatology of matter

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with a view to provide an eschatological hope and also to appreciate the sacredness of matter in Christian theology.

The challenges from evolution to the future of matter (evolution of matter as blind, purposeless, godless, impersonal, etc.) are addressed to a great extent by Teilhard de Cahrdin's Omega Point theory. In view of addressing the most contemporary cosmological challenges to the future of matter, I draw insights from the 'physical eschatology' of Freeman Dyson and Frank J. Tipler. As they face criticism from Science, Philosophy and Theology, I move on to the perspectives of contemporary scientist theologians (John Polkinghorne, David Wilkinson, and Robert J. Russell) in understanding the future of matter in new creation. The method applied is the method of theology of nature which derives the ultimate ground of hope from theological resources in dialogue with the Natural sciences.

2. Probing the origin and nature of matter

To explore the future of matter one must know the origin of matter. The origin of matter can be traced back to the origin of the Universe. Though there are many challenging scientific theories, the Big Bang theory is the most important scientific contender to explain the origin of the Universe today. According to this theory the Universe was originated some 13.7 billion years ago. It was first formulated by Georges Lemaitre, a Belgian priest in 1927 [1]. It is founded on the General Theory of Relativity that the force of gravity has the effect of 'curving' space and time [2]. Lemaitre postulated a universe which is expanding at the same rate everywhere and in all directions. He proposed that the Universe must have been formed in an explosion, a radioactive disintegration of a condensed primeval atom that contained all the matter in the Universe. All matter, the stars and galaxies, was concentrated into a very confined region in a primordial matter having infinite pressure, infinite density and infinite temperature [3]. This matter expanded rapidly and consequently exploded. In exploding, it cooled down, forming nuclei, then atoms, stars, galaxies and planets.

To know the future of matter one must know what matter is. In classical Physics matter is anything that occupies space and has mass. It is based primarily on the laws of motion and gravitation of Sir Isaac Newton [2, p. 16]. According to Newtonian physics matter and energy are two separate concepts. However, the twentieth century science, especially the quantum theory called in question the very foundation of the mechanistic world view of classical physics, especially the concept of the reality of matter [4]. According to this theory the subatomic units of matter are very abstract entities which have a dual aspect; they appear sometimes as particles and sometimes as waves. At the subatomic level, matter does not exist with certainty at definite places, at definite times and in definite ways but rather shows 'tendencies to exist' or 'tendencies to occur' [5]. The constituents of atoms, the subatomic particles, are dynamic patterns which do not exist as isolated entities, but as integral parts of an inseparable

network of interactions. Having touched briefly on the origin and the nature of matter from the perspective of physics, I move on to the views of Teilhard de Chardin on matter.

3. Future of matter as Omega Point: Teilhard de Chardin

What happens to matter in the Future? Telihard de Chardin (1881-1955) addresses this question in his evolutionary worldview which has its origin in the work *On the Origin of Species* by Charles Darwin (1809-1882). The ability of matter to organize itself into self-organizing systems and its inbuilt urge towards greater complexity are the vital dynamisms of the evolutionary process [6]. However the theory of evolution raises several questions and concerns as evolution seems to be pointless, blind and purposeless [7]. Teilhard responds to these challenges with his Omega Point. According to Teilhard there is one main axis of evolution, where increasing complexity and consciousness eventually leads to Homo sapiens [7]. At the lowest end of the axis, in non-living matter, he acknowledges an extremely limited kind of consciousness or psyche. When evolution reaches a critical degree of consciousness and complexity, reflective thought can appear for the first time on earth. Teilhard sees this new plane as the location where reflective thought (human mind) has emerged and also the beginning of a new layer (a thinking envelope), which will develop through ‚noogenesis' and eventually encircle the Earth as the ‚noosphere'. The Teilhardian evolutionary process starts in the geosphere, moving through biosphere and noosphere to omegasphere and culminates in the omega point (Christ) [8].

Teilhard has succeeded in presenting an optimistic view for the future of matter in the process of evolution; however he faces criticism for his failure in extending his vision to the whole of cosmos since he includes only the terrestrial world of humanity and all the species. According to the scientist-theologian John Polkinghorne, Teilhard's vision of the end is not physicalist but Eucharistic [9]. Another scientist-theologian Robert John Russell observes that the Teilhardian view of undermining the second law of thermodynamics and positing a novel form of energy in the complexification process of evolution is a crucial problem for Teilhard's entire approach. In his opinion "the study of nonlinear systems has shown that it is precisely through the dissipation of energy in open systems undergoing rapid fluctuations that new, highly ordered states can occur spontaneously out of old, low ordered states" [10]. According to Russell the Omega Point, representing a convergence of life and the coalescing of humanity, is tied to the Earth in Teilhard's thinking. *"It is true that Teilhard ultimately understood the Omega Point as lying beyond the cosmos, with the hyperpersonal converging on God. Still the earth, and not the cosmos, is a pivotal focus for the successive convergences in evolutionary history, including the biosphere and the noosphere. To what extent this raise a problem for Teilhard's vision, given the earth is a tiny part of the immense Universe, given the possibility of life elsewhere in the Universe, and given the faith of extinction for the Earth in the*

supernova of the Sun and the immensity of the far future of the Cosmos stretching beyond the extinction of the Earth?" [10, p. 279]

The Universe as we know today is enormously larger than Teilhard could have realized, given the date of his writing. How are we to think of the convergence of life on Earth as affecting the destiny of a universe of such magnitude? What about the other constitutive factors of the Universe apart from the Earth including dark matter and dark energy?

Teilhard opinion anyway deserves a more careful insight. According to Ludovico Galleni, it is Teilhard who opened a new perspective of doing theology from a cosmic perspective [11]. The biospherocentric theory, which counts Teilhard de Chardin among its founders, looks for connections between the different parts that constitute the biosphere and takes into consideration the whole biosphere as the evolving entity. In this approach, actually the biosphere itself is doing theology with the help of the noosphere which is the thinking sphere. In a biospherocentric perspective, the single human being (the person) is the result of the process of evolution, but in this theory the process involves the whole biosphere and is a way used by the biosphere for the maintenance of the stability of its parameters. The evolving biosphere, as a whole, presents parallelisms and canalizations which are the result of the tendency of evolution toward increasing levels of complexity and cerebralization. These tendencies indicate the presence of directionality, the main tendency of which is formed by the increasing growth of the brain and the emergence of the thinking creature. An eventual result of the thinking creature is the formation of the thinking sphere of the whole human culture: the noosphere.

In Galleni's opinion, the biosphere is no longer evolving passively and maintaining stability through negative feedback mechanisms that were established by its components, but it is also behaving actively due to the rational capacity of the noosphere for this task. For him, the whole process of maintaining biospheric stability includes a symbiotic relationship [11]. It means the noosphere is dependent on the biosphere and also providing the biosphere a more active process to preserve stability. Here Galleni finds a means for a new way of doing theology. It is a theology of nature whose context is that of nature, because it is a theology made by the biosphere and its thinking sphere with the task of maintaining its stability and survival. The result is the preservation of biosphere where the theologians of noosphere do their work. Moreover this perspective recovers the biblical concept of alliance or covenant. With the emergence of the noosphere, an alliance is proposed from the side of God. The task of Theology will be to give a purpose to the alliance between creatures and their creator in order to build an earth that can be a source of its Creators' delight. This alliance is not only the source of the individual's salvation but also an alliance for the building up of the actual earth, in which the biosphere can survive. Thus the biosphere perspective provides a universal meaning through the building up of the actual Earth.

The extension of this vision to the whole Cosmos is then presented by Ilia Delio. At this juncture it is worth noting the views of Ilia Delio who highlights the cosmic vision of Teilhard in her *Christ in Evolution* [12]. According to Ilia, it is true that Teilhard's vision is mainly based on the Earth but this is due to the fact that Teilhard's vision is a Christian vision. However she claims that one can trace universal meaning out of his vision. In her opinion Teilhard is working within Christian theology and the Eucharistic vision of Teilhard provides with a cosmic perspective. He perceives Christ not only at the heart of the Universe but at the heart of the material universe. He sees an intrinsic relation between Christ and the physical universe; Christ belongs to the very structure of the Cosmos. For Teilhard, between cosmogenesis and Christogenesis is anthropogenesis and noogenesis. He recognizes that there is a unifying influence in the whole evolutionary process, a centrating factor that continues to hold the entire process together and moves it forward toward greater complexity and unity. The Cosmos is evolving through reflectively thinking human beings toward its full realization in Christ, the Omega, who is the energizing principle underlying the process of evolution. Quoting J.A. Lyons, Ilia affirms the Teilhardian cosmic vision that "The cosmic dimension of Christ, therefore, expresses neither his divinity nor simply the created humanity of Jesus of Nazareth; rather, the incarnation in its cosmic dimension is Christ, the God-community, into which the human life and the whole cosmos are incorporated" [13]. Creation will not be complete until participated being is totally united with God through Christ in the pleroma when God will be "all in all" [13, p. 39].

Having seen the cosmic vision of Teilhard and the possibility of a new way of doing theology, we look for a truly cosmic interpretation of the Omega Point which takes into account the contemporary cosmological challenges to the future of matter.

4. Cosmological challenges and the cosmic interpretation of the Omega Point

Contemporary Natural science predicts devastating challenges to the future of matter. Renowned astronomer William R. Stoeger gives a detailed account of the possibility of astronomical and cosmological catastrophes [14]. The craters on the Moon and on Earth, mass extinctions in the fossil record, the frequent arrival of small meteorites, devastating impacts by asteroids and comets, cosmic gamma-ray bursts, the collisional coalescence of two neutron stars to form a black hole, etc. are evidences of this fact. According to Martin Rhees, "in about 5 billion years the Sun will die, swelling up into a red giant, engulfing the inner planets, and vaporizing all life on Earth; it will then settled down as a slowly fading white dwarf" [15]. Based on Einstein's general theory of relativity, contemporary scientists developed three different models on the fate of the Universe in accordance with the alleged mass and expansion rate of the present Universe. They are the closed universe, the open universe, and the flat universe models [16]. Nowadays there is a growing consensus among

scientists that the Universe is flat/open and will expand forever. The 1998 publication of Type Ia Supernovae and the recent results from Wilkinson Microwave Anisotropy Probe (WMAP), which led to the conclusion that the universe is composed of 4.6 percent of atoms, 23.3 percent of dark matter, and 72.1 percent of dark energy are evidences to the ever expanding, even accelerating Universe [17]. Fred C. Adams and Gregory Laughlin predict the fate of the open and ever expanding universe. In their view, once the Stelliferous Era is gone, the remaining history of the Universe is an endless dying process through proton decay, particle annihilation and black hole evaporation [18]. Considering all these models the Universe will come to a catastrophic end. The end of the Universe implies the death and decay of matter and its inbuilt potentialities.

One cannot disregard the nihilistic and dysteleological implications of the scientific predictions of the cosmic futility. It is reflected in the writings of Bertrand Russell and Steven Weinberg. In 1903, when the idea of the heat death of the Universe was brought to the great minds of the day, the British philosopher B. Russell derived from it the conclusion that life in the Universe is ultimately meaningless [19]. For Steven Weinberg "the more the Universe seems comprehensible, the more it also seems pointless" [20]. The pointlessness of the Universe and the meaninglessness of life in the Universe are pointers to the 'futurelessness' of matter. Having seen the cosmological challenges to the future of matter along with their nihilistic and dysteleological implications, we are in a position to access how well the proponents of 'physical eschatology' respond to the cosmological challenges to the future of matter and make a cosmological interpretation of the omega point.

Freeman Dyson and Frank Tipler are two prominent proponents of 'physical eschatology'. According to Dyson, life can continue indefinitely into the far future of the open universe. Dyson's scenario depends on accepting the premise that a living creature is a type of computer, imputing, processing, storing and exporting information [20, p. 283]. He assumes that protons are ultimately stable against all decay into lighter particles. But even if protons are gone, we shall still have electrons, positrons, photons and immaterial plasma as a vehicle for the patterns of our thought [21]. In contrast to Dyson's open universe eschatology, Tipler's model works with a closed universe. Tipler locates the search for physical eschatology within what he calls the 'Final Anthropic Principle' (FAP): the Universe must be such that intelligent life will continue to exist forever [10, p. 283]. The possibility of an infinite life depends on the availability of an infinite amount of information processing to take place between now and the final singularity. Tipler also acknowledges that in a closed universe an ever-increasing energy is required per bit near the final singularity. He suggests that this energy will come from a shear effect produced by an unevenly collapsing universe. "This shearing gives rise to a radiation temperature difference in different directions, and this temperature differences can be shown to provide sufficient free energy for an infinite amount of information processing between now and the final singularity." [22] In this

'infinite subjective time' life will completely engulf the universe and will incorporate more and more material into itself, and the distinction between living and non-living matter will lose its meaning. It is here that the Omega Point is reached. "At the instant the Omega point is reached, life will have gained control of all matter and forces not only in a single universe, but in all universes whose existence is logically possible; life will have spread into all special regions in all universes which could logically exist, and will have stored an infinite amount of information, including all bits of knowledge which is logically possible to know. And this is the end." [23]

In comparison with Dyson who proposes the process within the Universe as the subject of transformation not the Universe as a whole, Tipler proposes the first truly global eschatological scenario, which is broadly consistent with contemporary cosmology [24]. It circumvents the vulnerability of a Teilhardean terrestrial vision and allows for radical, unending openness by including all the past, present and future creation in its hermeneutic circle. However Tipler's Omega Point theory invites criticism from Science, Philosophy and Theology [24, p. 205]. The theological concern is primarily methodological. The Omega Point theory describes life in the far future in terms of omniscience, omnipotence, and omnipresence [24, p. 207]. This description provides the basis for a fascinating argument that life and God are identified in the Omega Point, which is both the last event in the universe and the boundary point of the universe. How strong a correlation can one make between the scientific means and the divine attributes? If Omega is the end point of the Universe, what then about Alpha, its beginning and its divinity? Tipler has, perhaps unconsciously, imported a conviction about God into his scientific discussion, essentially presupposing his conclusion. How one can argue from nature to God? Can one establish the existence of Omega and its divinity scientifically? It calls for addressing the methodological concerns in constructively interfacing eschatology and cosmology which we shall consider below.

A more adequate theological way to address the challenge coming from scientific prediction to Christian eschatology is the theology-of-nature approach which can be traced back to the Teilhardian approach. This approach derives the ultimate ground of hope from theological resources while acknowledging the need and benefit of engaging in dialogue with the Natural sciences. It presupposes the self-limit for Science but takes the implications of the scientific prediction of cosmic death seriously [25]. It does not make Christian hope merely existential, transcendental, or metaphysical in order to avoid or minimize the challenge from Science; rather, it remains faithful to the biblical promise of hope for the future of creation, and thus it makes the conflict with Science inevitable. This approach does not derive the ultimate ground of cosmic hope from a naïve, literal interpretation of biblical passages which speak of the future of creation; instead, it appeals directly to the norm of Christian faith and Theology: the Gospel of Jesus Christ in general and the bodily resurrection of Jesus in particular. The eschatological vision of the new creation as the redemptive transformation of the present universe provides us with the most

satisfying and most inspiring picture of the final destiny of the universe. As Teilhard, there are evidences of other contemporary scientist-theologians making use of this method today in understanding the future of matter with reference to the contemporary cosmological challenges. Though they deal primarily with the future of the Universe, its implications to the future of matter can be grasped vividly since matter being the constituent factor of the Universe. First, I shall consider the views of John Polkinghorne.

5. Future of Matter as transmutation: John Polkinghorne

Renowned physicist John Polkinghorne claims that Christian eschatological hope cannot be falsified by scientific prediction of cosmic futility because the ultimate end of the universe lies beyond it. He finds in the bodily resurrection of Jesus a proper analogy for the eschatological transformation of the futile universe (Romans 8.18-25, Colossians 1.15-20). He expects that there will be destiny for the whole Universe, just as there will be a post mortem destiny for humankind [9, p. 113]. Polkinghorne does not believe in an abrupt end of the Universe followed by a second creation out of nothing, for such an apocalyptic expectation weakens theological conviction of divine consistency [9, p. 15]. As the Lord's risen body is the eschatological transform of his dead body, the new creation will be the redeemed transform of the old. This implies that the new creation does not arise from a radically novel creative act *ex nihilo*, but as a redemptive act *ex vetere*, out of the old [26]. It clearly establishes the value of the old creation, since it affords the raw material for eschatological transformation into the new creation. Therefore, there will be both continuities and discontinuities between the old creation and the new creation. Polkinghorne introduces his meta-scientific insights to explore the continuities between the old creation and new creation.

Polkinghorne brings to light two complementary modes of reality to explain the complex process of continuity. One deals with energy and the other deals with pattern which means the formation of interrelated structure by which a top-down causality of the whole acts upon the parts [27]. The assumption that the information pattern of the old creation will be retained in its eschatological transformation is supplemented by two other assumptions about continuities between old creation and new creation [16, p. 205]**.** The first assumption is that the intrinsically dual aspect (energy-pattern) character of creaturely nature will continue to be even in the world to come. The second assumption, derived from general theory of relativity theory, is that the nexus of relationship between space, time, and matter will also continue to be valid even in the new created order [9, p. 117].

The ‚matter-energy' of the world to come will certainly have to be radically different in its physical properties to the matter-energy of this present creation. This implies there will have to be a discontinuous change of physical law. Polkinghorne assumes a transformation of space and time in the old creation into 'space' and 'time' of a different character in the new creation, in an

analogous way to the transformation of perishable matter into imperishable 'matter.' In this vein Polkinghorne believes that "the matter of the new creation will be divinely transmuted matter" [27, p. 39]. The transmutation of matter will bring about the necessary discontinuity and the carryover of the information pattern will guarantee the necessary continuity. "The new creation must be endowed with a totally different ‚physical fabric' from that of the old creation and, of course, this must be on a universe-wide scale." [9, p. 143] However Polkinghorne does not think that Christian hope can be grounded solely upon scientific or meta-scientific thinking, as if the potentiality of fulfilment has already been built into the present reality. The ultimate future does not belong to scientific exploration but to divine faithfulness [9, p. 12]. Key to his view is the empty tomb and resurrection because it means that the Lord's risen body is the transmutation and the glorification of his dead body. This gives hope for matter which participates in the resurrection transformation, enjoying thereby the foretaste of its own redemption from decay [9, p. 113].

Polkinghorne's concept of transmutation affirms the self-transcending nature and inbuilt dynamism of matter. Very specifically his meta-scientific insights are noteworthy as far as the continuity and discontinuity of matter in new creation is concerned. However, I claim that there is a disproportionate stress on continuity over discontinuity. He makes an easy distinction by locating continuity in the information pattern and discontinuity in the nature of matter. This promotes strong dualism and individualism. For example, Polkinghorne believes that the information bearing pattern of souls will be held in the divine mind to await its re-embodiment in the world to come. The analogy of the continuity of information pattern seems to be a virtual reality and a kind of cybernetic immortality where the human person is treated dualistically as software/hardware and thereby the human body is degraded [27, p. 39]. While Polkinghorne characterizes matter in new creation as 'radically different' he does not explain what the difference will be. He rejects panentheism in this creation and opts for it in the new creation. On such a view it is not clear what enables us to distinguish between God's existence and our own existence including that of matter in new creation? One can also question what differentiates matter from the life of Trinity? The ambiguities in Polkinghorne's views lead to the writings of David Wilkinson.

6. Future of matter as transformation: David Wilkinson

David Wilkinson gives a more comprehensive discussion of the continuities and discontinuities between the present creation and the new creation than does Polkinghorne. Noticing Polkinghorne's failure in maintaining continuity and discontinuity proportionately, Wilkinson critiques the soul language of Polkinghorne for not seriously taking the context of the information pattern in relation to other people and in relation to God [17, p. 145]. He says, "It is better to speak about matter-energy-pattern-information, and indeed to add context. We then need to say continuity and discontinuity within that." [17, p.

146] According to Wilkinson matter cannot be isolated from space-time or from its context and web of relations around it. He substantiates his idea with scientific and theological insights. He draws insights from the theory of relativity, quantum mechanics, chaos theory, complexity theory, Neuroscience and genetic studies to affirm scientifically the significance of context and relationship [17, p. 137]. In hope of overcoming the dualistic worldview of Polkinghorne, Wilkinson quotes biblical passages on the human person as a psychosomatic unity (e.g. Philippians 1.23, 1 Thessalonians 4.16) [17, p. 143 & 157]. He draws insights from feminist and sacramental theologies to show how a consideration of transformed relationships becomes a key to new creation, where these relationships are not merely between human beings and God but between personal and communal identity and the nature of matter. It is relationship to God that allows the pattern and matter to be configured in a way that represents continuity and discontinuity [17, p. 156]. The novel concepts of context and relationship enable Wilkinson to overcome the dualistic view imbedded in the views of Polkinghorne.

Wilkinson bases his arguments for the transformation of matter on the reality of resurrection. He locates the continuity in John 20.19-20, Mathew 28.9, Luke 24.42-43, and Luke 24.39. Similarly the discontinuity is located in John 20.14, John 20.19-20, and Mark 16.1-8. What differentiates Wilkinson from Polkinghorne is that for Wilkinson the continuity and discontinuity in resurrection must be seen in all four aspects of substance-form-mode-context. He adds, "It may be that the atom finds themselves in a different context and web of relationships. The suggestion of a different form of the laws of nature may be the way forward. Or our present laws of nature may admit the possibility of other dimensions of time and this may be a key to the transformation of matter." [17, p. 157] For him, the key to both continuity and discontinuity is to be found in the action of God. Resurrection reminds us that God acts in this creation for its renewal and transformation [17, p. 104]. The empty tomb demonstrates that the physicality of this world does matter to God and will not be completely destroyed or discarded in the new creation [17, p. 112]. While Polkinghorne emphasizes the faithfulness of God, Wilkinson holds together both faithfulness and action in God's transformative work. The transformability of the conditions and characteristics of the universe provides a glimpse of the transformative work of God and thereby becomes evidence to the faithfulness of God. Wilkinson's concept of transformation is an affirmation of the self-transcending nature and inbuilt dynamism of matter in the Universe.

For Wilkinson, the issue at stake in the scientific predictions of cosmic death is that of purpose or meaning of the cosmic history. In this regard, Wilkinson is emphatic on the challenge from Cosmology to Theology, but little on the challenge from Theology to Science. While trying to provide a comprehensive picture of both continuity and discontinuity I find Wilkinson fails to do justice to his scientific explanation. Though he suggests a different form of the laws of nature may be the way forward, he does not go into its depth in details. It is here I turn on to Robert John Russell for a more balanced

scientific explanation of continuity and discontinuity of matter from an eschatological perspective.

7. Future of matter as co-presence? Robert J. Russell

Being aware of the contemporary challenges and developments in Christian eschatology and cosmology, Russell uses Polkinghorne's ideas as a starting point. In order to further explore the continuities and discontinuities in transformation Russell introduces an extended methodology of 'Creative Mutual Interaction' (CMI). According to this method, a robust philosophical interpretation of scientific theories can lead to a creative reformulation of theological doctrines. In his opinion, a theology that is reformulated in light of Science can also lead to suggestions for fruitful new research programs in Science and in the Philosophy of science [10, p. 11]. According to Russell the challenge is not technically from science but from a philosophical assumption which we routinely bring to science, namely that scientific predictions necessarily hold. Instead he suggests another possibility for theologians to accept a very different philosophical assumption about the future predictions of Science while accepting what science tells us about the past history of the Universe [10, p. 24]. In Russell's view, "God must have created the universe such that it is transformable, that is, that it can be transformed by God's action. In particular, God must have created it with precisely those conditions in order to be transformable by God's new act." [10, p. 308] He says, "Science can be of immense help in understanding the needed conditions and pre-conditions for this transformation. The conditions and characteristics of the present creation which are expected to be continued into the new creation are referred to as 'elements of continuity' and those which are not expected to be continued as "elements of discontinuity." [10, p. 309]

With reference to the bodily resurrection of Jesus, Russell directs us towards a radical transformation of the background conditions of space, time, matter, and causality and also a permanent change in at least most of the present laws of nature. He calls it FINLON, the "first instance of a new law of nature" and also the "first instance of a new law of the new creation" [10, p. 309] By eternity Russell means an eternity of renewed and transformed creaturely life in which creatures retain their distinctive personal and social histories along with the specific temporal events of past, present and future that underlie them and that are intrinsic to their identity, but without the separation of times into a past that is forever gone and a future that is never available in the lived moment. The eternity bequeathed to the New Creation is a form of true temporality, a structured duration of diversity in unity. It is an eternity which holds all the events of creation in an over-arching and differentiated unity, a unity which brings together our lived experience of the flow of fragmentary present moments without subsuming their distinctions or separations into one timeless moment.

In the light of Science, Russell makes use of three key concepts to explain further the 'continuity', 'discontinuity' and the preconditions for transformation

in the new creation which he has drawn and interpreted from Pannenberg and reconstructed in light of Science and Mathematics. They are: (a) duration, (b) co-presence and (c) prolepsis. Though these are concepts related to time, the inextricable relationship between time, matter and space enable us to conceive its implications to the future of matter.

7.1. Duration

Duration means time even in nature is not point-like, instead time involves duration, or temporal thickness, not only in our conscious experience of memory and anticipation but also in nature, including its fundamental processes [10, p. 313]. The basis for duration both in consciousness and in the physical world is the temporal structure of eternity. Here eternity as a divine attribute takes up the times of our lives and unifies them *via* duration, even if we only experience this unity briefly.

7.2. Co-presence

Duration in eternity includes an intrinsic structure which is referred to as 'co-presence' [28]. Here duration is a differentiated unity which holds together as co-present all events in the history of the Universe both now and in the eschatological New Creation. Within the duration of eternity each event retains its unique past and future. Russell calls this time's 'past-present-future structure' or 'ppf structure' [10, p. 316]. All events, in turn, each with their own 'ppf structure', are held together without conflation and without separation in the duration of eternity: that is, they are held together 'simultaneously' as the eternity of the differentiated unity of the Trinitarian God. The *distinction* between events in time will be sustained in eternity while the *separation* between events in time will be overcome in eternity. Time in eternity is understood as a co-present flowing time. In essence, the world as we know it is in fact being continually being taken up into the presence of the Resurrected Lord and the eschatological future even as it also simply moves forward into the ordinary future, the mere continuation of ordinary, physical time.

7.3. Prolepsis

Prolepsis is a strikingly topological view of the relation between creation and the New Creation in which the eschatological future 'reaches back' and is revealed in the event of the Resurrection of Jesus. This 'reaching back' is not within the *topology*, or spatial structure, of the Universe as we know it. It is something like a 'reaching back' from the eschatological future into our world and history. So prolepsis means "the future is already present and active in the present while remaining future, as exemplified by God's act in raising Jesus from the dead" [10, p. 313] Russell's concept of prolepsis and eschatological theologian Ted Peters' proleptic thinking are complementary. In Peters' view the

resurrection of Jesus is the prolepsis of new creation. For him, God is omega and all things will be transformed at the omega coming of the Almighty. He calls this line of thinking retroactive ontology [29].

Through his ideas of duration, co-presence and prolepsis, Russell gives a very clear scientific insight into the concept of 'differentiated unity' in the new creation where Polkinghorne and Wilkinson fail to do justice to it. It is true that Russell does not address the future of matter specifically as he does with the future of time. But I find his idea of 'co-presence' can be extended to matter precisely because of the intrinsic and inextricable relationship between space, time and matter. How can matter be co-present? It should take into account Russell's concept of NIODA (Non-Interventionist Objective Divine Action) [10, P. 125]. For non-interventionist objective divine action to be intelligible in the light of science, the events that results from God's action must occur within a domain of nature in which the appropriate scientific theory can be interpreted philosophically in terms of ontological indeterminism. The events must be considered as direct, mediated, and objective acts of God. In NIODA God acts without suspending the laws of nature. When Russell suggests the transformation of the physical laws in new creation, what would happen to NIODA in the new creation? What kind of law will be operative in the new creation? In fact, the insight lies in Russell's own view of duration that duration is a differentiated unity which holds together as co-present all events in the history of the universe both now and in the eschatological New Creation. The intrinsic and inextricable relationship between space, time and matter enable one to understand the future of matter as co-presence in differentiated unity. The innate dynamism and the inbuilt potentialities of matter are oriented towards the 'co-present differentiated unity' in the new creation.

8. Conclusion: towards a renewed eschatological hope in the cosmic matrix

Having gone through the views of prominent scientist theologians one will understand that the inner being of matter is essentially dynamic and self-transcending. Teilhardian evolutionary process that culminates in the Omega Point affirms the inner dynamism of matter. The proponents of physical eschatology, especially Tipler, attempt at the cosmological interpretation of the Omega Point, but receive conceptual and methodological criticism from philosophy, science and theology. Polkinghorne's meta-scientific insights and his concept of the transmutation of matter in relation to Jesus' resurrection provide an authentic eschatological hope for matter, but his dualistic approach and eschatological panentheism remain problematic. Wilkinson's idea of transformation based on the resurrection event addresses the challenge from cosmology to the future of matter to a great extent, but suffers from facing the challenge from Theology to Science. In spite of the complexities, Russell's scientific insights on co-presence and differentiated unity provide a deeper understanding of the future of matter in the new creation. From a critical

perspective none of these views are perfect, but the logical progression in the line of thinking of the scientist-theologians with specific reference to the resurrection of Jesus provides one with a genuine eschatological hope amidst the scientific predictions of cosmic futility.

While affirming the dynamic and self-transcendental nature of matter, the views of scientist theologians intelligibly underline the immanence of God in matter. The new understanding of matter enables one to appreciate the sacredness of matter and helps to give up the idea that the world is profane and the matter is evil. The eschatological understanding of matter is significant from the point of interreligious dialogue. It is viewed in general that the cosmic religions (Hinduism, Buddhism, Jainism, etc.) are predominantly cosmos centred and the Semitic religions (Christianity, Islam, Judaism, Zoroastrianism etc.) are mainly God-human centred. For example, Hinduism is a religion that keeps matter very dear to its psyche and treat matter and the whole of universe with great respect and reverence and. The Hindu Scripture *Bhagavad Gita* describes that the divine Lord is present at 'the heart of all things', as their 'source of life', as their 'inner light' and 'final goal' (15:15, 7:9, 13:18). After understanding the eschatological significance of matter in the cosmological context, one can confidently engage in dialogue with the proponents of cosmic religions, highlighting the cosmic richness of Christian theology. In fact, it liberates one's theological outlook from its dualistic and anthropocentric pre-occupations.

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