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Scripture and an Evolving Creation¹

The interpretation of Scripture in the light of modern knowledge is an important dimension of the interaction between science and Christian theology. Particular attention is paid to the primeval narratives of Genesis 1-3, the wisdom literature and the prophets of the Exile. The Fall is reconsidered and associated, not with the origin of biological death, but with mortality, human anxiety at the transience of life consequent upon a chosen curvature into the self which alienated humans from the God who is the only true ground of hope. Evolutionary understanding encourages the concept of divine purposes being fulfilled through an unfolding process of continuous creation. A world in which creatures 'make themselves' is a great good but it has an inescapable shadow side. This insight offers some help with the problems of theodicy.

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At its best, Christian thinking has always sought to be in a positive relationship with general human culture. Acts 17 portrays Paul as being willing to quote Stoic poets when he addressed the cultured sceptics of the Athenian Areopagus. In the second century, the Apologists, such as Justin Martyr, set out to defend Christian belief in the intellectual context of the later Roman Empire. When Augustine came to write his *Literal Commentary on Genesis*, despite what the title might suggest to a modern reader, he was not concerned with a flat-footed biblical literalism but he acknowledged that if well-established conclusions of secular thinking appeared to contradict a traditional scriptural interpretation, then that interpretation would need to be reconsidered – a dictum to which Galileo was to appeal some twelve centuries later. John Calvin's well-known concept of accommodation, accepting that the biblical authors wrote in fashion that was comprehensible to their contemporaries and that the purpose of the Holy Spirit was not to teach astronomy, showed that a high respect for the authority of Scripture was compatible with an acceptance of modern knowledge.

In the aftermath of the publication of *The Origin of Species*, the welcome that Christian thinkers such as Asa Gray in North America, and Charles Kingsley and Frederick Temple in Great Britain, gave to Darwin's insights shows that the popular myth of an implacable opposition between religion and science following 1859 is just a historically ignorant distortion of the truth.

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Even so conservative a thinker as Benjamin Warfield, writing towards the end of the nineteenth century, could say that he 'did not think that there is any general statement in the Bible or in any account of creation, as given in Genesis 1 and 2 or elsewhere alluded to, that need be opposed to evolution'.²

These positive assessments encourage the twenty-first century Christian thinker to a further engagement with issues related to scriptural interpretation and contemporary evolutionary science. Three principal kinds of biblical material are particularly relevant to the task: Genesis 1-3; the wisdom literature; and the concern with God's new acts displayed in the writings of the prophets of the Exile and in the eschatological expectations of the New Testament.

The presence at the start of the Hebrew Bible of two different creation stories (the sophisticated Priestly account of Genesis 1:1 to 2:3, and the earlier account of Genesis 2:4-25) is, of course, sufficient in itself to indicate that we are not being given a divinely endorsed blow-by-blow account of literal happenings. Something more profound is being offered than a short cut to scientific knowledge, a divine gift that might save us the trouble of doing cosmological and biological research. The essential message of Genesis 1 is the theological insight that nothing exists except by the will of God, an understanding conveyed in the eightfold repetition of the formula 'And God said...'. Even if one translates Genesis 1:1 as 'When God began to create...', rather than in the more absolute sense of 'In the beginning God created...', it is clear that God is the master of *tohu wabohu*, the formless void. Comparisons are often made with the Babylonian and other Near Eastern creation myths but, while there are certainly connections, it is very impressive to note the degree to which the Hebrew account is free from any extreme embarrassment for the modern reader. Here is no story of a conflict between the god Marduk and the goddess Tiamath, with the former slicing the slain corpse of the latter in two in order to make heaven and earth out of the separated halves.

It would be quite inappropriate to the genre of Genesis 1 to read it anachronistically as a prefiguration of our modern scientific understanding of cosmic and terrestrial history. Nevertheless, it is striking that creation starts with a burst of light [energy] (Gen. 1: 3); that vegetation [photosynthesis] has an early role (Gen. 1: 11); that animal life starts in the waters (Gen. 1: 20) and then moves onto the land (Gen. 1: 24). Of course, there are also dissonances with modern understanding. The birds come too early (Gen 1: 20) and, most notably, the sun, moon and stars do not appear until the fourth 'day' (Gen. 1: 16), after the plants. The exegete will understand that a theological agenda has been at work in this last matter, since it was important to the writer to make it clear that the heavenly bodies are not to be esteemed as deities, a point that illustrates well the complex character of the text.

² Quoted in Alexander, D.R. *Rebuilding the Matrix*, Oxford: Lion (2001), p. 201.

It would also be anachronistic to make too much of the fact that, though in the Priestly account creation comes into being through the effectual utterance of God, it does so sequentially, as part of a process that unfolds over the six 'days' of divine work. As a matter of fact this gave Augustine some perplexity, since he believed (in a manner that is actually consonant with the way that Einstein's theory of general relativity, fifteen centuries later, regards space, time and matter as constituting a single integrated 'package-deal') that time was brought into being along with everything else as a consequence of God's atemporal creative decree. Augustine sought to resolve the dilemma that this seemed to present to him in relation to the Genesis story, by supposing that God's great atemporal initiating act created 'seeds' that would in due course germinate at different times to produce an emergent sequence of creatures. Similar ideas are found in Gregory of Nyssa. Thus a notion of some sort of unfolding creative process was not totally foreign to the ancient world, but it would certainly be mistaken to claim this as a prefiguration of the radical temporality of modern evolutionary theory. It was only when people began to realise the vastness of the timespans of past history and to consider the evidence provided by the fossil record, that the fixity of species, seemingly so obvious to everyday observation, came into question and a truly evolutionary picture of the history of life became a possibility.

Before we leave the interpretation of Genesis 1, some attention needs to be paid to verses 24 and 25. The former has God saying 'Let the earth bring forth of living creatures of every kind', while the latter says 'God made the wild animals of the earth of every kind'. The modern exegete will claim that here it is made clear that no sharp distinction is to be drawn between natural process (Gen. 1: 24) and divine action (Gen.1: 25) – see also verses 11 and 20-21 in this respect. This is one of the most important points to be recognised in the discussion of how theology relates to an appropriation of the insights of evolutionary biology. The God who is the ordainer and sustainer of nature, acts as much in and through natural processes as in any other way. Christianity emphatically rejects a Manichaean opposition between God and nature, or a Marcionite divorce between the lesser creator of the world and the God and Father of our Lord Jesus Christ. Much of the disturbing rejection of truthful insight that occurs in so-called 'creationism', stems from a failure to take this point seriously. Ironically, the true relationship of God to nature is affirmed in the very chapter of Scripture to which the creationists wish to appeal.

The older creation account of Genesis 2 is very human-oriented and it leads naturally to the story of the Fall in Genesis 3. Of all the classic Christian doctrines, this is the one that demands the most careful revisionary evaluation in the light of modern knowledge. It is clear that the Augustinian interpretation, based on the idea that original human sinning also marred a prior perfection in the non-human creation, is one that is impossible for us to believe today. In particular, it is certain that death was prevalent for many millions of years before the appearance of any hominids. After all, it was the extinction of the dinosaurs sixty-five million years ago, probably through the impact of an aster-

oid or comet on the Earth, that gave the little furry mammals that were our ancestors their evolutionary chance. An Irenaean concept of creaturely growth into maturity and fulfilment is much more congenial to modern thinking than Augustine's notion of a decline from a paradisaal state.

How then are we to deal with the powerful and mythic narrative of Genesis 3? It has often been remarked that the Fall involved is a fall upward, the gaining of the knowledge of good and evil (Gen. 3: 5 & 11). This gives us the clue, I believe, to how we should today interpret the narrative in a manner that reveals its essential theological content.³ Human beings differ from their animal cousins in being self-conscious, aware of themselves and aware of the distant future. Of course, the higher animals are conscious, but they seem to live in the near present. The chimpanzee can figure out that throwing the stick may dislodge the banana, and recognise that the person who has disappeared from sight has merely gone behind a rock. However, even the primates do not look far into the future or brood upon the eventual certainty of their deaths. This unique human feature of self-consciousness, our remarkable ability to use the future tense, must have dawned at some stage in hominid evolutionary development. It seems impossible to imagine in any detail how this novel emergence actually occurred, but it seems reasonable to suppose that it was accompanied also by the dawning of a degree of conscious awareness of the divine presence, another apparently unique human faculty. When all this was happening, there occurred a turning away from God into the human self. Our ancestors became, as Luther was later to say, *incurvatus in se*, curved in upon themselves in a process that spurned God and God's grace. That human turning inwards was the Fall – not a single disastrous ancestral event, but a process that was an attempt to claim human autonomy and to refuse heteronomous dependence upon divine grace, a deeply mistaken move of which we are now all the heirs. This did not bring biological death into the world, but it did bring what one might call 'mortality'. Our self-conscious ancestors had become aware that they lived as mortal beings, facing eventual death. At the same time, they had alienated themselves from the God whose faithfulness is the only true ground for belief in a destiny beyond death.⁴ As a result, sadness at the transience of life and the inevitability of death entered into human experience. The ground was 'cursed' (Gen. 3:17), not because thorns and thistles had not been a part of nature before, but because the certainty of mortality came to make all human struggle seem ultimately frustrating and pointless.

I believe that this interpretation of the Fall does all the essential theological work that Paul would require of it in his extended discussion in Romans 5:12-21, where Jesus Christ is presented as the second Adam who undoes the bondage of the Fall. In this passage, Adam surely need not to be understood as

³ Polkinghorne, J.C. *Reason and Reality*, London: SPCK/Trinity Press International (1991), ch. 8.

⁴ Polkinghorne, J.C. *The God of Hope and the End of the World*, London: SPCK/New Haven: Yale University Press (2002).

the unique progenitor of the human race, but rather as a symbolic figure standing for the common condition of humanity before God. The sin that came into the world was the rejection of dependence upon God and a turning into the human self treated as if it were totally self-sufficient (cf. Gen. 3:5). The death that came into the world was a deep sadness at mortality. Christ reversed this state of affairs by reconciling us to God (2 Cor. 5:19) and through his resurrection destroying the power of death (1 Cor. 15:34-37).

While much Christian discussion and controversy about creation has concentrated on the opening chapters of the Hebrew Bible, there is a great deal of relevant scriptural material to found elsewhere in its pages, notably in the wisdom literature and in some of the psalms (e.g. Ps. 19 & 104). A repeated theme is the grandeur of God that is revealed in the works of creation, a point taken up by Paul in the New Testament in his celebrated endorsement of the possibility of a natural knowledge of the divine nature, affirmed in Romans 1:20. One of the most striking sources in the wisdom literature is the Book of Job. Following chapter after chapter of argument between Job and his friends about the significance of the great troubles that have fallen upon him, in the course of which Job longs to confront God with his case (Job 13:3), the Lord finally speaks to him out of the whirlwind (Job 39-41). What is said is very strange. God makes no attempt to tackle directly the problems of theodicy that have been the concern of the preceding chapters, but instead the Lord directs Job to look to the fruitfulness and wonder of the created world. He is told to lift up his eyes and 'Look at Behemoth [a mythical monster standing for the non-human creation], which I made as I made you' (Job 40:15). God, it seems, is pointing to concerns that lie beyond the little world of humanity. It also seems that this reply – this awesome encounter with the sacred presence of the Creator – is a response sufficient for Job, notwithstanding his earlier demands for justifying argument. 'I had heard of you by the hearing of the ear, but now my eyes see you; therefore I despise myself and repent in dust and ashes' (Job 42:5-6).

Evolution, both in its cosmic and in its terrestrial aspects, has an impressive tale to tell. The universe as we know it today, sprang out of the singularity of the big bang 13.7 billion years ago. It all started very simple, for the very early universe was just an almost-uniform expanding ball of energy. Evolutionary process has turned that world into one that includes the home of saints and scientists. The history of the universe is a story of immensely fruitful process. While there has been much contingent detail in this story of unfolding fertility, there was also an inbuilt propensity, present from the start, towards evolving such complexity. As far as we know, the universe was about ten billion years old before life appeared on its scene, and our sort of self-conscious life only emerged yesterday in terms of cosmic timescales, but there is a very real sense in which the universe was pregnant with the possibility of life, essentially from the big bang onwards. The set of insights called the anthropic principle asserts that the physical fabric of the world – the character and strengths of the forces described by those laws of nature that constitute the ground rules controlling any form of physical becoming – had to take a very specific, 'finely-tuned' form

if there were to be the possibility for carbon-based life anywhere at all in the cosmos.⁵ A modern-day Job spoken to out of the whirlwind could be pointed to phenomena very much more impressive even than the wild ox and the ostrich (Job 39: 9, 13).

Scientists who work in fundamental physics are frequently deeply impressed by the rational beauty and deep order that is disclosed to their researches. Wonder may not be a word that appears very often in sober scientific papers, but it does occur as an indispensable word in less formal discourse, as the physicists acknowledge this experience of wonder as the reward that comes to them after all the laborious effort necessarily involved in doing research. The basic pattern of the cosmos is profoundly intellectually satisfying. It has turned out time and time again that the equations that successfully describe fundamental physics are always endowed with the unmistakable character of mathematical beauty. The search for such beauty is a recognised heuristic strategy, thus making the seemingly abstract pursuit of mathematical reasoning the key for unlocking the secrets of the physical universe. *The Wisdom of Solomon* asserts that God 'arranged all things by measure and number and weight' (Wis. 11:20), a verse that religious scientists, from the first stirrings of proto-science in the Middle Ages onwards, have from time to time appealed to as an encouragement to recognise that mathematics affords the natural language to use for understanding the physical structure of creation. The same apocryphal book speaks of God as having given to its author 'unerring knowledge of what exists, to know the structure of the world and the activity of the elements; the beginning and the end and the middle of times... the cycles of the years and the constellations of the stars' (Wis. 7:17-22). Science is a gift of God, part of the bestowal of the *imago dei*.

Behind all this thinking there lies a kind of natural theology appealing to the order and fruitfulness of the world as signs of the divine Mind and Purpose that undergird its history. Yet an honest theologian must also admit that this is only one half of the story of creation. As well there is its shadow side, the destructiveness and apparent wastefulness of nature that must also be taken into account. The Bible is often very matter of fact about such matters. Psalm 29 celebrates a great storm sweeping across the Levant and bringing devastation in its train, seeing it as an occasion for all in God's temple to cry 'Glory!'. Psalm 104 simply notes that 'the young lions roar for their prey, seeking their food from God' (Ps. 104: 21). These are the counterparts in created nature of those human acts of war and genocide that occur so frequently in the Deuteronomic history (Joshua to 2 Kings) and which are often disturbingly portrayed as being carried out at divine command. Yet the Israelites were also aware of the continued threatening presence of the waters of chaos, which they believed were only restrained by God's power (e.g. Ps. 66:7 & 93:3-4).

⁵ Barrow, J. Tipler, F. *The Anthropic Cosmological Principle*, Oxford: Oxford University Press (1986); Leslie, J. *Universes*, London: Routledge: (1989).

Evolutionary thinking is helpful to contemporary theologians, arguing from a perspective inevitably different in significant respects from that of the biblical writers, as they wrestle with the issues of theodicy posed by a world that is both beautiful and ugly, at once fruitful and destructive. Jacques Monod characterised evolution as involving an interplay between the contrasting tendencies of Chance and Necessity.⁶ We can accept his analysis, provided we understand the meaning of these words in the right way. Chance is not intrinsically capricious or meaningless, but it simply stands for the contingent particularity of what has actually happened. The richness of created possibility is so great that only a small fraction of what might have happened has actually occurred. Necessity stands for the lawful regularity of the world, to whose specific and finely-tuned character the atheist Monod paid too little attention. Evolutionary process is the shuffling exploration of potentiality, as creation's inherent fruitfulness is brought to birth through creaturely happenstance. The right theological way to think about this was formulated by Charles Kingsley and Frederick Temple in the years following 1859. Each said that, while God could no doubt have produced a ready-made creation, the Creator had chosen to do something cleverer than that in making a world in which 'creatures could make themselves'. The God who is Love did not bring into being a puppet theatre in which the divine Puppet-Master would pull every string, but the gift of the divine agape was a world in which creatures are granted a due independence to be themselves and to make themselves.

Science has increasingly come to recognise that the regimes in which it is possible for genuine novelty to emerge are always regimes held 'at the edge of chaos'. Too far on the orderly side of that frontier, and things are too rigid for there to be any possibility beyond the mere rearrangement of what already exists. Too far on the disorderly side, and things are too haphazard for any novelties that might emerge to be able to persist. If there were no genetic mutations, life would be locked in its present form, without any possibility for the development of new species; if the mutation rates were too high, no species could become established, on which selective processes would operate.

A creation in which creatures make themselves is a great good, but it has a necessary cost. Its shadow side is that transience and death are inevitable, as each generation has to give way to its successor. Blind alleys and ragged edges are inescapable in the contingent exploration of possibility. That is why the present world is a 'creation subjected to futility' (Rom. 8:20). The engine that has driven the three to four billion year history of terrestrial life has been the genetic mutation of germ cells, producing new possibilities for life and turning a world that originally had contained only single-celled organisms into a world that is now the home of self-conscious beings. Yet if germ cells are to mutate in this way, it is inevitable that somatic cells will also sometimes mutate and become malignant. You cannot have the one without the other. Fruitful process

6 Monod, J. *Chance and Necessity*, London: Collins (1972).

entangles order and disorder in an inextricable way. The presence of cancer in creation, anguishing a fact though it is, is not something gratuitous that a Creator who was more competent or more compassionate could readily have eliminated. It is the shadow side of a world in which creatures are allowed to make themselves. The prophets of the Exile, with the enhanced sense of the tragic that that experience had given to them, perceived something of this necessary ambiguity present in creation. In second Isaiah, God says, 'I am the Lord, and there is no other. I form light and create darkness, I make weal and create woe; I the Lord do all these things' (Isa. 45:6-7). The words are chilling, but modern science helps us to understand why this is so.

In Israel, it was these prophets of the Exile who particularly faced the challenge of the strangeness of history, in which the good are not simply rewarded and the bad not simply punished, in the manner that the Deuteronomic historians had naively supposed would be the case. These later prophets were spectators of, and commentators upon, events, such as the captivity and the destruction of the Temple, that appeared to frustrate God's purposes rather than fulfilling them. Nevertheless, out of their struggles to make sense of these perplexing happenings, there came a recognition of divine providence as being at work in ways that are patient and faithful, and ultimately hopeful. The word 'new' (*chadash*) appears significantly more frequently in their writings than it does elsewhere in the Hebrew Bible. Ezekiel speaks of a new heart and a new spirit (Ezek. 11:19; 36:26); second Isaiah prophesies new things to come (Isa. 42:9; 43:19; 48:6); third Isaiah foresees a new heavens and a new earth (Isa. 65:17; 66:22).

One can interpret these insights in two ways today. One comes from our greatly enhanced understanding of the fruitful unfolding of cosmic process. History has not been an unending succession of similar events, but it has been characterised by a succession of emergences of the new: stars and galaxies, formed by the condensation of primeval matter; heavy chemical elements, made in the interior nuclear furnaces of the stars; terrestrial life; consciousness; self-consciousness. The evolutionary picture offered to us by modern science suggests to theology that it should see creation as a grand temporally-unfolding improvisation, in which Creator and creatures all play their parts, rather than its being the performance of a fixed score, 'pre-written' by God in eternity. Central to theology's appropriation of this insight is an understanding that has been powerfully present in much twentieth-century thinking, recognising that the act of creation has been an act of the kenotic self-limitation of divine power, freely embraced by a Creator who allows creatures to be themselves and to make themselves.⁷ Perhaps we may see some hint of the costliness to God of the divine love's letting be the otherness of creatures, in God's words in Hosea in the face of apostasy, 'How can I give you up, Ephraim? How can I hand you over, O Israel?' (Hos. 11:8). In the New Testament, Paul speaks

⁷ See the essays in, Polkinghorne, J.C. (ed.) *The Work of Love*, London: SPCK/Grand Rapids: Eerdmans (2001).

of the Spirit's involvement in the travail of creation, uttering 'sighs too deep for words' (Rom. 8:18-27). Above all, the cry of dereliction from the cross (Mark 15:14; Matt. 27:46) expresses the participation of God-in-Christ in suffering and loss, even to the paradoxical depth of the experience of God-forsakenness.

These kenotic ideas of divine relationship to a world of true becoming, run contrary to the picture in classical theology of a Creator who exercises a total control of history from the invulnerability of an eternal vantage point outside of time itself. However, these ideas do seem close to the way in which the Bible portrays God as in continuous interaction with the history of the chosen people of Israel, and embracing temporality in a unique way in the incarnational episode of the Word made flesh (John 1:14). The Hebrew Bible is bold enough to portray God as changing the divine mind (e.g. Exod. 32:14; 2 Kings 20:1-6) and as setting choices before the people that they themselves must make (Josh. 24:14-28; Ezek. 18). A number of contemporary theologians also believe that, in a creation that is a world of temporal becoming, the kenotic act of creation has also involved a self-limitation of divine omniscience, since even God does not yet know the unformed future.

In an evolving universe, if its history is truly to be understood as a continuous creation, God must be presently active not only in the gift of fruitful potentiality expressed in the form of lawful Necessity, but also in the contingent happenings of exploratory Chance. Only thus could we see cosmic process as involving the full participation of both Creator and creatures. In the 1990s, the science and theology community devoted much effort to the discussion of divine action, considered in the light of modern science.⁸ Appeal was made, in a variety of ways, to the manner in which twentieth-century science, through its discoveries of the intrinsic unpredictabilities present in quantum theory and chaos theory, had disposed of a merely mechanical picture of the physical world. The universe is more subtle, and it was argued also more supple, than simply its being a gigantic piece of cosmic clockwork. In consequence, the grain of created nature was seen to be sufficiently open as to be able to accommodate top-down forms of agency, complementing the bottom-up causal account of the exchange of energy between constituents that is science's standard story, and so allowing the exercise of intentional action, both human and providential. It is not necessary here to go into the details of these diverse discussions, but it did become clear that science, properly interpreted, had not established the causal closure of physical process in a way that would have ruled out divine interaction in the course of unfolding continuous creation. Nor does it follow that a role for creaturely contingent action necessarily precludes the Creator

8 Russell, R.J., Murphy, N. & Peacocke, A.R. (eds.) *Chaos and Complexity*, Vatican Observatory (1995); Russell, R.J., Stoeger, W.R. & Ayala, F.J. (eds.) *Evolutionary and Molecular Biology*, Vatican: Vatican Observatory (1998); Polkinghorne, J.C. *Belief in God in an Age of Science*, New Haven: Yale University Press (1998), ch. 3; Russell, R.J., Clayton, P., Wegter-McNelly, K. & Polkinghorne, J.C. (eds.) *Quantum Mechanics*, Vatican: Vatican Observatory (2001).

from being able to achieve determinate ends, albeit by contingent paths. The biblical picture of God, ceaselessly at work in history seeking to bring about the divine purposes, carries just such an implication. William James liked to speak of the cosmic game of chess in which the divine Grand Master will win the game, whatever moves the creaturely club player may choose to make.

This interactive picture of creation, in which the Creator acts alongside creatures as history unfolds, contrasts with another kind of theological thinking that has recently received a lot of attention, in which God is understood to exercise power not so much contemporaneously but from the future, in order to draw creation towards purposed ends.⁹ Scriptural appeal is made to the divine role of the One who is to come and to God as Omega (Rev. 1:4; 22:13). I find significant difficulty in reconciling this extreme finalist picture with what science has to say. If discourse about the power of the future has a theological role, I would prefer to think of it not as a metaphysical account of a mode of divine action, but as a way of expressing confidence that God will not be thwarted in bringing about ultimate salvific purposes. The problem with the stronger understanding is not simply that all the causes that science discerns have the character of acting from the past,¹⁰ but also that the future state of this world is predicted to be one of eventual futility. The future, in fact, looks bleak. Either through decay or through collapse – freeze or fry, one might say – the universe is destined to die. It is as certain as can be that, if its history continues as science predicts, there will come a time when all carbon-based life will prove to have been a transient episode, by then everywhere brought to an end.¹¹ This challenging assertion turns our attention to the second way in which one may interpret the biblical expectation of the ‘new’. It looks not to the present kind of continuing creation, but to the eschatological hope of transformation into the new creation.

This theme was adumbrated already in the verses in third Isaiah about the new heaven and the new earth (Isa. 65:17; 66:22). The New Testament takes up the tale (e.g., 2 Cor. 5:17; Rev. 21:1-6), and it understands the resurrection of Christ to be the seminal event from which the new creation has already begun to grow (1 Cor. 15:20). Obviously, this is a theme about which a this-worldly science cannot speak directly. We have already seen that the transience and death that characterise the present are the necessary shadow side of an evolving fertility. In terms of science’s understanding of process, these properties derive from the thermodynamic drift from order to disorder that charac-

9 See, e.g., Teilhard de Chardin, P. *The Phenomenon of Man*, London: Collins (1959); Peters, T. *God – the World’s future*, Minneapolis: Fortress (1992); Pannenberg, W. *Towards a Theology of Nature*, Louisville: Westminster/John Knox (1993); Haught, J. *God after Darwin*, Boulder, CO: Westview Press (2000); Moltmann, J. *Science and Wisdom*, London: SCM Press (2003).

10 The fundamental equations of physics are time-reversible, that is they do not incorporate an intrinsic distinction between past and future. As a consequence, these equations admit solutions expressing either causal influence from the past (retarded potentials) or causal influence from the future (advanced potentials). However, it is found empirically that only retarded potentials are needed to describe the actual processes of the physical world.

11 See, Polkinghorne *op. cit.*, (4) ch. 1.

terises the physics of this universe. Yet, it seems a perfectly coherent possibility that God could ordain a new form of 'matter', endowed with such strong self-organising principles that disorder would no longer triumph over order in the long run. However, accepting this possibility immediately raises the serious theological question of why this state of affairs is not already the case. If the new creation will be free from death, mourning, crying and pain (Rev. 21:4), why did the Creator bother with the old creation, full of mortality, sadness and suffering? The Bible does not seem to address this point directly, but it is one that a contemporary theologian cannot ignore.

I think that the answer lies in recognising that God's creative purpose is necessarily a two-step process.¹² This world is intended to exist at some distance from its Creator, whose presence must be veiled and activities reserved, if finite creatures are to be able to be themselves and to make themselves without being overwhelmed by the divine infinity. However, it is not God's intention that this state of affairs should go on for ever. The life of this world is preparatory for the life of the world to come. Eventual hope is for 'What no eye has seen, nor ear heard, nor the human heart conceived, what God has prepared for those who love him' (1 Cor. 2:9, quoting Isa. 64:4). That redeemed and renewed world of the new creation will be different, just because it will be in a different relationship to its Creator. The new creation will have entered freely into the progressively unveiled presence of God, gaining access across the bridge between creaturely and divine life that is constituted by the incarnate Word. Hence the remarkable emphasis that the New Testament places on the cosmic significance of Christ (Rom. 8:18-23; Col. 1:20, where it is all things (not just all people) who are redeemed). One might express the difference by saying that this world contains sacraments, covenanted occasions in which the veil covering the divine presence is thinned, but the world-to-come of the new creation will be wholly sacramental, totally infused with the life and energies of God. God's purpose is to transform the old creation into the new creation, just as Christ's dead body was transformed into his risen and glorified body.

The early pioneers of science, most of whom were religious believers, liked to say that God had written two books, the Book of Nature and the Book of Scripture. Both should be read, and when this was done correctly there could be no contradiction between them since they had the same Author. I hope that this exploration of scriptural interpretation in the light of contemporary scientific knowledge will afford a modest affirmation of this ancient principle. Truth is one, and scientific truth and theological truth are not in conflict, for they complement and illuminate each other.

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¹² *ibid.*, ch. 10.