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The Boyle Lecture 2003: Darwin, Design and the Promise of Nature

The religious world in general and the Christian world in particular have had a very difficult time coming to grips with the Darwinian portrait of life on Earth. The main issue, now as always, is that of how to reconcile evolution with the idea of divine providence. After Darwin, what does it mean to say that God ‘provides’ or cares for the world?¹ Prior to the age of science, of course, suffering and evil had already raised weighty questions about God’s care for the world, but our new awareness of evolution has amplified them considerably. What then does providence mean if life comes about and diversifies on Earth in the manner proposed by Darwin and his neo-Darwinian descendents?

The pre-scientific cosmos, at least at first sight, seems more congenial to belief in divine providence than evolution allows. The dominant world-picture in Western thought after Plato generally consisted of a ladder of distinct levels, a Great Chain of Being, running from lowly matter at the bottom to divine creative wisdom at the top.² The intervals between matter and God were taken up by plants, animals, humans and angelic beings, all contributing to a rich vertical plenitude of creation wherein every being had its divinely assigned station. And, most notably, the ontological discontinuity differentiating the contiguous levels allowed humans to think that they were radically distinct from other living beings, and perhaps cared for in a special way by God.

However, let us compare this venerable hierarchical cosmology with the picture of the universe that the natural sciences have recently drawn up. Imagine thirty large volumes on a bookshelf, each tome 450 pages long, and every page standing for one million years. Let this set of books represent the scientific story of a 13.7 billion year-old universe. Our narrative begins with the Big Bang on page one of Volume 1, but the first twenty-one books show no overt signs of life at all. The Earth-story begins in Volume 21, 4.5 billion years ago, but life still doesn’t appear until Volume 22, about 3.8 billion years ago. Even then, living organisms do not become particularly interesting, at least in human terms, until almost the end of Volume 29. There the famous Cambrian explosion occurs, when the patterns of life suddenly burst out into an unprecedented array of complexity and morphological diversity. Dinosaurs come in around the middle of Volume 30 but are wiped out on page 385. Only during the last sixty-five pages of Volume 30 does most mammalian life come into existence. Our hominid

1. In responding to this question, I shall deliberately overlook the traditional distinction between general and special providence, especially since the former often tends to think of God in a deistic manner while the latter often does so in an excessively interventionist sense.

2. Lovejoy, A.O. *The Great Chain of Being: A Study of the History of an Idea*, New York: Harper & Row (1965).

ancestors begin to show up several pages from the end of volume 30, but modern humans don't appear until the bottom of the final page. The history of human intelligence, ethics, religious aspiration and scientific method takes up only the last few lines on the last page of the last volume of the story.

Can we ever hope to rewind the providential vine that clung for centuries to the vertical, hierarchical cosmology around the new 30-volume horizontal narrative of a world still in process? Can the religious sensibilities and aspirations pruned in the context of ancient and medieval cosmologies survive and find new life in the radically different picture of the cosmos now emerging? If so, in what sense would they still be continuous with religious tradition. And again, what can the doctrine of divine providence mean in light of the Darwinian chapters of the new cosmic story?³

The 'temporalising' of the Great Chain of Being that began to take place even prior to Darwin is not by itself necessarily a threat to the providential understanding of nature. The principle of plenitude, which holds that every step in the hierarchy of being must be occupied by some proportionate mode of being, could in principle be satisfied by a providential 'programme' for the gradual unfolding of creation.⁴ But what most perplexes theology is the Darwinian recipe for the evolution of life over the last 4 billion years. Evolution's ingredients can be reduced to three generic features: (1) *contingent events* such as the accidents involved in the spontaneous origin of life, random genetic variations (mutations) that constitute the raw material of evolutionary diversity, and undirected occurrences in natural history, such as climatic changes or meteorite impacts, that shape the pathways of evolution in unpredictable ways; (2) *lawful constraints* that include not only 'natural selection' which mercilessly weeds out all nonadaptive forms of life, but also other physical, mathematical and biological factors that keep contingency within bounds; and (3) *deep cosmic time*, the billions of years that the universe has made available to evolution for its plentiful experiments with life.

The major question for theology, now as in the years immediately subsequent to the publication of Darwin's *Origin of Species*, is how to reconcile the brute impersonality and blindness of the three items in evolution's recipe with trust in divine providence.⁵ Of course, there is more to evolution than the struggle and predation that Darwinians typically highlight. Evolution is not all competition and waste, but also symbiosis and cooperation. Still, as scientific information of natural history has accumulated after Darwin, the ideas of providence and evolution have not become any easier to tie together.⁶ Life's long journey, as

3. For further discussion see Haught, J. F. *God After Darwin: A Theology of Evolution*, Boulder, Colo: Westview Press, (2000).

4. Gillispie, C.C. *Genesis and Geology: A Study in the Relations of Scientific Thought, Natural Theology, and Social Opinion in Great Britain, 1790-1850*, Cambridge, Mass: Harvard University Press, (1996), p. 18.

5. See Gillispie, *op. cit.* [4] p. 220.

6. For a discussion of some previous attempts to connect God and evolution in England see Bowler, P. *Reconciling Science and Religion: The Debate in Early Twentieth-Century Britain*, Chicago: University of Chicago Press, (2001).

we now realise, has left such a wide trail of loss and pain that many sensitive people have given up trying to make religious sense of it at all. For some, the Darwinian account of life stretches the persistent problem of theodicy far beyond the breaking point. The idea of divine providence has generally been associated closely with a divine 'plan', 'purpose' or 'design', but there seems to be little in the Darwinian charting of life's journey that corresponds to such cosy concepts. Cataloguing signs of divine design was the backbone of Robert Boyle's natural theology and the famous lectures he endowed.⁷ But, were he here with us today, Boyle himself might agree that after Darwin any natural theology built solely or primarily on the notion of design is hardly destined to prosper.

The Boyle Lectures that took place mostly between 1692 and 1732 in defence of the rationality of Christianity make it evident that science-minded religious thinkers at that time were much more impressed than are most scientists today by the purposeful ordering of nature, especially the adaptive design in living phenomena.⁸ Any claim that nature's designs can lead the mind directly to God, or that reason without the help of revelation can confidently affirm the existence of a providential divine plan for nature, is no longer easy to defend, at least among the scientifically educated. Most biologists today are convinced, in any case, that purely natural evolutionary mechanisms are sufficient to account for the adaptive design that nests organisms in their specific environments. Moreover, Darwinians now interpret the 'design' in life as only apparent. The eye, for example, may seem to be the product of intelligent contrivance, but it is really the unintended outcome of a process of blind natural selection. The adaptive complexity in the life-world today stands at the end of an unimaginably protracted period of time during which the 'struggle for existence' has led to the 'selection' of some species and organisms while washing out most others along the way. Should we be completely surprised, then, when the renowned biologist George Williams calls nature a wicked old witch?⁹

Does Evolution Rule out Divine Providence?

As for Charles Darwin himself, the excessive amount of pain constitutive of the life-world ruined his earlier belief in divine oversight of the world. But he and Williams are not alone among great scientists scandalised by the way life processes work. To give just one other example, Sir Charles Sherrington, in his 1940 Gifford Lectures (*Man On His Nature*), expresses similar dismay at the disproportionate amount of suffering caused by parasites:

7. Boyle, R. *Works*, Birch, T. (ed.), 6 volumes, London: J. & F. Rivington, (1772); see Brooke, J.H. *Science and Religion: Some Historical Perspectives*, Cambridge: Cambridge University Press, (1991). For an excellent introduction to the Boyle Lectures see Andrew Pyle's essay online at: http://www.thoemmes.com/theology/boylelec_intro.htm

8. See Ruse, M. *Darwin and Design: Does Evolution Have a Purpose?*, Cambridge, Mass: Harvard University Press, (2003).

9. Williams, G.C. 'Mother Nature Is a Wicked Old Witch' in Nitecki, M.H. & D.V. (eds.) *Evolutionary Ethics*, Albany, NY: State University of New York Press, (1995), pp. 217-231.

There is a small worm (Redia) in our ponds. With its tongue-head it bores into the lung of the water-snail. There it turns into a bag and grows at the expense of the snail's blood. The cyst in the snail's lung is full of Redia. They bore their way out and wander about the body of the snail. They live on the body of the snail, on its less vital parts for so it lasts the longer; to kill it would cut their sojourn short before they could breed. They breed and reproduce. The young wander within the sick snail. After a time they bore their way out of the dying snail and make their way to the wet grass at the pond-edge. There amid the green leaves they encyst themselves and wait. A browsing sheep or ox comes cropping the moist grass. The cyst is eaten. The stomach of the sheep dissolves the cyst and sets free the fluke-worms within it. The worm is now within the body of its second prey. It swims from the stomach to the liver. There it sucks blood and grows, causing the disease called 'sheeprot'.

The worms then lay eggs that make their way down the animal's liver duct and finally exit into the wet pasture. 'Thence as free larvae they reach the meadow-pond to look for another water snail. So the implacable cycle rebegins.'

What does all of this mean? Sherrington has no idea:

... it is a story of securing existence to a worm at cost of lives superior to it in the scale of life as humanly reckoned. Life's prize is given to the aggressive and inferior of life, destructive of other lives at the expense of suffering in them, and, sad as it may seem to us, suffering in proportion as they are lives high in life's scale. The example taken is a fair sample of almost countless many.¹⁰

Even if liver flukes exhibit a mesmerising inventiveness, it is not easy to attribute their ingenuity to beneficent divine design. There can be no edifying religious message at least on this page of the book of nature. Prior to Darwin a prevalent justification of belief in providence was the display of adaptive living design that the Boyle Lectures and, later, William Paley had highlighted. However, Darwin apparently provided an adequate account of the design in living beings without resorting to theology at all. Natural selection of random variations could explain life's design, provided that there is enough time. And time there has been in abundance. Even before Darwin geologists had already demonstrated that Earth's life-journey had taken at least some millions of years. And Darwin had no idea that life actually originated as long as 3.8 billion years ago, leaving more than enough opportunity for even the most improbable instances of adaptive design to come about gradually, in a purely natural way. The vast amount of time in which change can occur randomly and piecemeal in evolutionary history eliminates the need for *ad hoc* interventions by supernatural engineering.¹¹ Thus, any return today to a natural theology built around the notion of divine design in living beings will seem unreasonable to those who are fully aware of deep time and Darwinian evolution.

10. Sherrington, C. *Man on His Nature*, Cambridge: Cambridge University Press, (1951), p. 266.

11. Dawkins, R. *Climbing Mount Improbable*, New York: W. W. Norton & Co., (1996).

A New Natural Theology?

Nevertheless, natural theology, as Robert Boyle might be satisfied to find out, has not gone away completely. Instead of looking closely and minutely at living organisms and their exquisite adaptivity as the primary evidence of a designing Deity, a revived natural theology today gazes out more expansively at the larger cosmic context in which the life-story is embedded. Life, as scientists today see more clearly than only half a century ago, cannot be understood apart from its larger cosmic context and the history of the whole universe.¹² In light of contemporary astrophysics the original and fundamental cosmic conditions that made for a life-bearing universe appear themselves host to a providential fine-tuning.¹³ A more sweeping view of nature than that provided by evolutionary biology now provides an alluring opportunity for natural theology to exhibit evidence of divine intelligence in nature after all.¹⁴ Even those theologians who spurn natural theology can no longer be too dismissive of this proposal. After all, if life had been intended by God to emerge and evolve in our universe, it would not be surprising if we discovered that the conditions for such an adventure had been built into the physical foundations of nature from the very start.

Even if this is so, however, the Darwinian character of evolution remains an enigma – and a serious challenge to natural theology. The randomness, waste and suffering that accompany biological evolution still raise questions about divine providence conceived of as design. Knowledge of evolution may even lead sensitive souls to curse those finely-tuned cosmic conditions that made possible the excessive suffering that many living beings must endure. Cosmic design, as the authors of *Job* and *The Brothers Karamazov* timelessly admonish us, is little comfort to those who wonder why life on Earth has been so prone to pain and perishing.

Is Blind Trust Enough?

What justification, then, could there possibly be for trusting in divine providence amidst the darkness of evolution? One response is that of blind, unconditional trust in God in spite of apparent absurdity. Accordingly, not being able to make theological sense of the Darwinian recipe should not prevent the devout from still trusting that there may be a hidden meaning in evolution, one that it would be presumptuous to try to access. Maybe ‘contingent’, ‘accidental’, ‘random’ and ‘wasteful’ are terms that we ignorant mortals attach to evolution only because of our abysmal ignorance of God’s wider vision for the universe. Whenever anything takes place that falls outside our own sense of appropriate

12. Rees, M.J. *Just Six Numbers: The Deep Forces that Shape the Universe*, New York: Basic Books, (2000).

13. See, for example, Polkinghorne, J. ‘Creation and the Structure of the Physical World’, *Theology Today*, (April, 1987) 44, 53-68.

14. See, for example, Davies, P. *The Mind of God: The Scientific Basis for a Rational World*, New York: Simon and Schuster, (1992).

order, we tend to refer to it as an accident or absurdity, but perhaps it is *really* part of a wider and eminently wise divine plan to which we are not privy, and into which we should not pry.

If we take this posture of pure trust, we might conjecture that what appears to be absurd contingency from a human perspective could be the tangled underside of a tapestry which, from God's vantage point on the other side, is a tightly woven pattern. As for the struggle, cruelty, waste and pain in evolution – evidence, at least to many, of a universe beyond the pale of providence – Darwin's recipe has absolutely nothing qualitatively new to add to the perennial challenges to faith. Genuine piety by its very nature is already quite fully apprised of the realities of evil and suffering, but it trusts *in spite of* all apparent absurdity. Indeed, too much intellectual self-confidence may even deaden a faith that arrives at authenticity only by embracing, not removing, radical uncertainty. Thus, a contemporary awareness of life's evolutionary struggle may pose no more of an obstacle to trust in divine providence than suffering and evil have ever done.

Many deeply religious people, including some scientists and neo-orthodox theologians, are quite content to take this approach to evolution. They confess that they cannot reconcile the ruthlessness of Darwin's recipe with their own belief in divine providence. But they allow that their own human (including scientific) perspectives are finite, and that they are simply not in any position to declare that mother nature is a wicked old witch or that the Darwinian universe is essentially indifferent or evil.

Providence as Darwinian Pedagogy?

This strictly fideist perspective, however, can at best tolerate, it can never celebrate, evolution, or attempt seriously to integrate it deeply into a theological vision. It remains essentially a defence against Darwinism, even though there may be no formal attempt to refute evolutionary biology in the aggressive manner of contemporary creationism and what has come to be called Intelligent Design Theory.¹⁵ Of course, to some degree every theological interpretation of evolution has to partake of faith's encouragement to trust. But theology is also obliged to give reasons for its hope, and this imperative must lead to bolder speculation about the possible meaning of the Darwinian recipe than we have just seen. Blind trust in God is not the only option available to scientifically enlightened religious believers. This is why a reasonable theology need never dispense completely with natural theology as a component of its quest to understand the ways of God.

One intriguing attempt to make providential sense of evolution is a variation on the ancient religious intuition that Earth was set up by God as a school for life, and indeed a 'soul school' for humans. Perhaps nature's severe Dar-

15. For a discussion of 'Intelligent Design Theory' see Dembski, W. & Ruse, M. (eds.) *Debating Design: From Darwin to DNA*, New York: Cambridge University Press, (2004).

winian curriculum is providentially justifiable if it makes life strive for more life. After all, how could organisms, from bacteria to humans, ever really be alive – much less thrive – without having to strive and struggle? And how anaemic of soul would humans be if the terrain over which their own lives travelled were devoid of obstacles and dead ends? If Earth were a totally accommodating abode, our lives would languish for lack of enticement.

Perhaps then the Darwinian domain was crafted deliberately by God especially to prepare human beings for the attainment of eternal life.¹⁶ Once humans emerged in life's Darwinian curriculum, the formula that gave rise to so much abundance and diversity of life beforehand could now function as the pedagogical context for moulding human character. What more fitting environment for soul-making could any of us have conjured up than the one that Darwin laid out a century and a half ago? Guy Murchie, in his colourful book *The Seven Mysteries of Life*, elaborates on this hypothesis. Earth, in all its evolutionary ruthlessness, he argues, may best be thought of as a 'soul school'. Try to imagine that you are the Creator, Murchie proposes. Then what kind of a world would *you* create? Would it be one in which we could all luxuriate in blissful and undisturbed tranquillity and hedonistic enjoyment? Not at all:

Honestly now, if you were God, could you possibly dream up any more educational, contrasty, thrilling, beautiful, tantalizing world than Earth to develop spirit in? ... Would you, in other words, try to make the world nice and safe – or would you let it be provocative, dangerous and exciting? In actual fact, if it ever came to that, I'm sure you would find it impossible to make a better world than God has already created.¹⁷

So this is the best of all possible worlds, after all, and Divine providence is manifest in the rigour as well as the creativity of evolution.

The idea that God is a practitioner of tough love can be found scattered throughout the Bible, and especially in Hebrews 12:5-13. But it is not hard to imagine how such an outlook on suffering could at times build resentment and even hatred of God for making the world so unnecessarily severe. Moreover, a soul-making theodicy tends at times to interpret the entirety of creation as serving only the goal of human salvation. Its approach to providence renders the story of the universe ultimately inconsequential except as a stage for the human drama of salvation. Thus, the evolution-as-curriculum proposal can easily seem excessively anthropocentric or too Earth-centred for refined ecozoic and cosmic tastes.¹⁸ Even if human suffering were a proportionate punishment for our guilt, we would still have cause to wonder, along with Darwin, about the

16. See the comparable suggestions by Hick, *J. Evil and the God of Love*, revised edition, New York: Harper & Row, (1978), pp. 255-261; 318-336.

17. Murchie, G. *The Seven Mysteries of Life: An Exploration in Science and Philosophy*, Boston: Houghton Mifflin, (1978), pp. 621-622.

18. This, I believe, is a major failing of John Hick's soul-making theodicy as expressed in *Evil and the God of Love*, in spite of several attempts on his part to acknowledge the dangers of anthropocentrism.

excessiveness of pain experienced by other living beings. Why do they have to go to 'school' with us? The soul-making theodicy may be a small part of a larger set of truths, but I am convinced that theology must look for deeper ways of thinking about providence in a post-Darwinian context.

Providence in Cosmic Directionality?

Perhaps then the works of Teilhard de Chardin (1881-1955) and Alfred North Whitehead (1861-1946), who discern a less soul-centred and more cosmic *directionality* in evolution, can provide a vision of nature compatible with both science and trust in providence.¹⁹ For example, those who look deeply into Teilhard's writings may actually come to 'see' quite clearly that there are meaningful trends in cosmic process usually overlooked by evolutionary materialists and cosmic pessimists.²⁰ Doesn't the fact that the universe unfolds from simplicity to complexity, that it evolves from mindless materiality through life to conscious self-awareness, justify a religious suspicion that a nurturing divine sponsorship somehow shepherds such a remarkable adventure?

Along with a general trend toward increasing complexity-consciousness, one may also observe, with the famous Jesuit paleontologist, that there has been an increasing 'centration' at the heart of the cosmic and evolutionary process.²¹ From the beginning, 'matter' has had a tendency to congeal around centres that function as attractors toward more complex and emergent levels of being. A progressively richer nucleation occurs in the atom, the eukaryotic cell, the central nervous systems of vertebrates, and most obviously human subjectivity. And now that humans have become the dominant terrestrial species in evolution, the habitual cosmic 'search for a centre' expresses itself in a novel way in Earth's religious traditions. Religions fit comfortably into cosmic evolution as characteristic ways in which the universe continues, at the human stage of becoming, its ageless search for a transcendent Centre. Instead of interpreting religious trust in a providential Centre as incompatible with evolution, the Teilhardian vision portrays such trust as absolutely indispensable to the ongoing creation of the universe.²² Even our own search, here and now, for the meaning of providence in an age of evolution is an integral part of the process of evolution itself.

In brief, the fact that the universe has converged from the fragmentary atomic simplicity of its origins to higher degrees of complexity-consciousness-centration is for Teilhard a hint that at a very deep level, perhaps inaccessible to science, nature has been graced all along by a providential influence. But

19. See the essays in Teilhard de Chardin, P. *The Future of Man*, Denny, Norman (trans.), New York: Harper Colophon Books, (1964).

20. Teilhard de Chardin, P. *The Human Phenomenon*, Appleton-Weber, Sarah (trans.), Portland, Oregon: Sussex Academic Press, (1999).

21. Teilhard de Chardin, P. *Activation of Energy*, Hague, René (trans.), New York: Harcourt Brace Jovonavich, Inc, (1970), pp. 31-35; 99-127.

22. *ibid.*

what about all the messiness and suffering in evolution? For Teilhard these tragic realities are not the consequence of a primordial human fault, nor are they essentially divine pedagogy – even though *per accidens* they may prove to be instructive at times. Rather, such evils are the dark side of an unfinished universe. An incomplete cosmos by definition is one that has not yet been brought to perfection, and it is in the *inevitable* darkness of its present incompleteness that excessive suffering, physical evil, and sin too, can gain a foothold.

Why *inevitable* darkness? Because any creation that is all light from the outset, completely unblemished by any shortcomings, would be already finished. And such a creation could really never become distinct from its maker. If it were perfect from the start the world would have no autonomy, no narrative self-identity and no ‘otherness’ vis-à-vis its maker. In other words, it would not be a world at all but a simple appendage to deity. Thus, Teilhard seems to be saying, a God who truly *cares* for the universe must suffer the pangs of allowing it only gradually and experimentally to become itself. The alternative would be no real creation at all.²³ Providence makes no sense apart from a gradually emerging universe. And the appropriate religious response to suffering and evil is not to make legitimate room for these in the world by way of a theodicy based on guilt and punishment, or even pedagogy, but to hope for a future of new creation in which God will decisively conquer them. There is no presently satisfying speculative answer to the problem of suffering, but there can at least be an effective posture of response to it – that of hoping for its eventual defeat. Hoping is the human form of groping, the way in which our species joins in with the whole history of striving that we call life. Failure to hope is, in effect, to depart from the stream of life.

Another conjunction of providence and creative process is implied in the cosmological vision of the great mathematician and philosopher Alfred North Whitehead. Whitehead’s expansive vision weaves life’s evolution into an overall cosmic process whose general orientation is that of bringing about intense *beauty*. Beauty is a difficult notion to define, but it implies, at the very least, a ‘harmony of contrasts’ or an ‘ordering of novelty’. Without the novelty of contrast there would be only bland order. But without order the elements of novelty and contrast would dissolve into chaos. Beauty is a delicate balance of coherence and complexity, unity and diversity. It embraces local shades of disharmony, bringing them to aesthetic resolution within an ever widening cosmic vision.²⁴

It is toward composing more expansive and more intense beauty, according to Whitehead, that our universe has always been aiming. It has not always suc-

23. These are thoughts scattered throughout the essays in Pierre Teilhard de Chardin’s audacious collection *Christianity and Evolution*, Hague, René (trans.), New York: Harcourt Brace & Co., (1969).

24. Whitehead, A.N. *Adventures of Ideas*, New York: The Free Press, (1967), pp. 252-296; Whitehead, A. N. *Process and Reality*, corrected edition, Griffin, D. R. & Sherburne, D. W. (eds.), New York: The Free Press, (1978), pp. 62, 183-185, 255 and *passim*; Whitehead, A.N. *Modes of Thought*, New York: The Free Press, (1968), pp. 8-104. See also Hartshorne, C. *Man’s Vision of God*, Chicago and New York: Willett, Clark & Company, (1941), pp. 212-229.

ceeded in this objective, but overall the natural world has in fact made its way from simplicity to complexity, from triviality to more intense versions of ordered novelty – that is, beauty.²⁵ In its aiming toward beauty, the most sublime of all values, the universe shows itself, therefore, to be something more than mindless meandering. It is not rash to suspect that from its beginning the cosmos has manifested at least this ‘loose’ kind of teleology.

Darwinian evolution, in all its waywardness, fits quite comfortably into this generous cosmology. Although Darwinian process leads toward the intensification of beauty in ways that may not conform to our usual human standards of conduct, this need not obscure the fact that the universe, at least in a generally directional way, is in the business of enlarging the sway of beauty. But why does the universe have this urge to move beyond the status quo at all? Why the impetus for so much novelty, contrast and diversity? And why is the cosmic making of beauty spread out over so many billions of years? Why has there been so much evolutionary drama, including not only the bringing of beauty into being, but also an exorbitant amount of tragedy and loss? And why did life have to take so long to complexify to the point of becoming endowed with consciousness and the capacity for goodness and worship?

Whitehead’s aesthetic cosmology would consider all of these puzzling features of the cosmos, including Darwin’s recipe, to be consistent with the notion of a God whose ‘design’ for the universe is the *maximising of beauty*.²⁶ And if God is also thought of as infinite love, then this love would act most effectively not by forcing its will onto the cosmos but by allowing the universe to unfold spontaneously, according to its own cadence, though always within the context of relevant metaphysical constraints. Moreover, Whitehead thinks of God as a compassionately empathetic redeemer, able to heal – in ways that humans cannot fathom – all the tragedy and suffering that occur in the cosmic process. In this Whiteheadian vision, the sometimes troubling Darwinian picture of life turns out to be consonant with a providential God whose power consists essentially of persuasive love. Since genuine love by its very nature cannot be dictatorial, a God who loves and cares for the world’s autonomy would not force the universe to reach the fullness of perfection in the magic of a single momentary act of institution, but would leave space and time for the universe to emerge as its own distinct reality – and at its own pace.

Consequently, the piecemeal, experimental and profligate way in which the cosmos and life evolve should come as no major surprise to those who believe in a God of love. It is not unreasonable to speculate that by gently presenting to the world relevant new possibilities for ‘becoming itself’, a persuasive God would provide a much sounder metaphysical explanation of the evolutionary story of life than pre-scientific versions of theism, mechanistic materialism or

25. Whitehead, *Adventures of Ideas*, p. 265.

26. For this and other aspects of ‘process theology’ see Cobb, J.B., Jr. & Griffin, D. *Process Theology: an Introductory Exposition*, Philadelphia: Westminster Press, (1976), pp. 123-124.

Intelligent Design Theory could ever hope to offer. Such an explanation would in no way contradict Darwin's science, but would instead provide a cosmological and theological context that can make very good sense of it.²⁷

Providence and the Promise of Nature

However, acknowledging the general cosmic directionality that both Teilhard and Whitehead – each in his own way – articulate is still not enough to constitute a theology of evolution. From a Christian theological point of view, at least, it must also be demonstrated that both the processive character of the cosmos overall, and the troubling Darwinian recipe in particular, are precisely what one should expect if the world is both grounded in and ultimately saved by the God revealed in Jesus Christ.

Without contradicting the Teilhardian and Whiteheadian sweeping attempts to interpret the cosmos and evolution in generally religious terms, Christian theology must reflect on evolution more explicitly in the light of its own revolutionary understanding of God. If, as Christians believe, the roots of its tradition lie in the story of Jesus, the one taken to be the visible face of the invisible God, and in whom the fullness of the Godhead dwells bodily, then a theology of evolution must make this teaching its very point of departure. It must then show that a Christian understanding of God in some *systematic* way embraces and brings intelligibility to the life-world as science now understands it.

This task may not be easy, for Christians believe that divine providence is actively, personally and passionately involved in life, whereas Darwinism understands life in terms of purely natural causes. If the cosmos itself is able to bring about life and its diversity in a purely blind and natural manner, how might theology provide any deeper illumination? Furthermore, since Christians believe that God cares for the weak and the poor, why is the process of natural selection permitted to eliminate so ruthlessly all incompetent, maladaptive forms of life? And if Christians believe that God is eager to create goodness and to redeem all suffering, why is the creative process drawn out for so long a time inconclusively?

I believe theology may effectively display the theological harmoniousness of divine providence with Darwinian evolution if it takes as its starting point only two outstanding features of the image of God that emerge from its revelatory sources. The first of these is the theme of the 'descent of God'.²⁸ The second, a motif that permeates the biblical literature, is that of the God who opens up the future by making promises and dependably keeping them. I believe that on these two closely allied pillars of faith Christian theology may construct a plausible theology of evolution.

27. In making these points, I need to emphasise that I am not embracing every aspect of Whitehead's philosophy.

28. For a useful study of the history of this theme see Hallman, J.M. *The Descent of God: Divine Suffering in History and Theology*, Minneapolis: Fortress Press, (1991).

The Descent of God

In Philippians 2:5-11 Jesus is pictured as being in the form of God, but, not clinging to that status, he empties himself and becomes a slave. Theological reflection has often taken this intuition by nascent Christianity (possibly derived from an early liturgical hymn) to entail that what is being emptied out is really the very being of God. But the notion of divine emptying (*kenosis* in Greek) does not depend solely on a single text from Philippians. It is Jesus' entire life and death on the cross that reveal to Christians the astounding notion that God is essentially humble, self-emptying love that gives itself away unreservedly to the entirety of creation for the sake of gathering that creation into the divine life. In fact, in the light of God's self-revelation in Christ, one may read the entire body of biblical narrative as straining to tell the story of the humble descent of the infinite God into the domain of creaturehood – all for the sake of deeper intimacy with the created world.

As theologian Donald Dawe writes:

God accepted the limitations of human life, its suffering and death, but in doing this, he had not ceased being God. God the Creator had chosen to live as a creature. God, who in his eternity stood forever beyond the limitations of human life, had fully accepted these limitations. The Creator had come under the power of his creation. This the Christian faith has declared in various ways from its beginning.

However, Dawe continues, 'the audacity of this belief in the divine *kenosis* has often been lost by long familiarity with it. The familiar phrases "he emptied himself [*heauton ekenosen*], taking the form of a servant", "though he was rich, yet for your sake he became poor", have come to seem commonplace. Yet this belief in the divine self-emptying epitomises the radically new message of Christian faith about God and his relation to man.'²⁹ Here, I believe, the doctrines of creation and incarnation allow us to go beyond Dawe's anthropocentric language and speak of God's kenotic relationship to the *entirety* of nature.

Theologian John Macquarrie, echoing Dawe, notes how radical the transformation of the God-image has been in Christianity:

That God should come into history, that he should come in humility, helplessness and poverty – this contradicted everything – this contradicted everything that people had believed about the gods. It was the end of the power of deities, the Marduks, the Jupiters...yes, and even of Yahweh, to the extent that he had been misconstrued on the same model. The life that began in a cave ended on the cross, and there was the final conflict between power and love, the idols and the true God, false religion and true religion.³⁰

29. Dawe, D. *The Form of a Servant*, Philadelphia: The Westminster Press, (1963); see also Moltmann, J. *The Crucified God*, Wilson, R. A. & Bowden, J. (trans.), New York: Harper & Row, (1974); and Von Balthasar, H.U. *Mysterium Paschale*, Nichols, Aidan, OP, (trans.), Edinburgh: T & T Clark, (1990).

30. Macquarrie, J. *The Humility of God*, Philadelphia: The Westminster Press, (1978), p. 34.

Our question, then, is what this revolution in the understanding of God – and hence of divine providence – has to do with the evolution of life. An evolutionary theology, I would suggest, must picture God's descent as entering into the deepest layers of the evolutionary process, embracing and suffering along with the *entire* cosmic story, not just with the recent human chapters. The Spirit of God stretches the divine compassion out across the totality of time and creation, enfolding and healing not only human struggles and suffering but also the epochs of evolutionary travail that preceded our emergence. In spite of its endless diversity, there is a fundamental unity to the life process; and *all* of life is linked, throughout its evolution, to the eternal ground that we may call Life-itself. There is an ontological coherence – rooted in the very being of God – that ties together the striving, achieving and failing of all shades and stages of life. The continuous biological drama of striving, failing and achieving connects our own lives even to the most archaic instances of metabolism. Providence, therefore, must be thought of not only as divine care for humans and our history, but as God's care for the totality of life and the cosmic process that sponsors life.

Redemption must mean, then, at the very least, that the whole story of the universe and life streams into the everlasting bosom of divine compassion. While incorporating our human stories into the divine being, the God revealed in Christ assimilates into the divine eternity, and hence into ultimate redemptive bliss, the *whole* story of life on Earth (and life elsewhere in the universe if it exists there). And since the entire physical history of the universe, as recent astrophysics has made clear, is tied into the existence of life everywhere, theology can no longer separate human hope for ultimate deliverance from the larger cosmic course of events. Because of the divine omnipresence, nothing in the universe-story or in life's evolution can occur outside of God's own experience. If Jesus is truly the Incarnation of God, then his experience of the Cross is God's own suffering. By virtue of life's unbroken historical unity Christian theology may be so bold as to assume also that the aeons of evolutionary suffering in the universe are also God's own suffering. And this would mean that the whole of nature in some way participates in the promise of resurrection as well.

But how does the theme of the divine descent help us understand why life, in the first place, has unfolded on Earth in the ragged manner that evolutionary science has depicted? Why are struggle and death constitutive of the ongoing creation of life? Why does God's creation, once life comes about, no longer follow the path of pure design that natural theologians and Intelligent Design proponents would prefer?

There is a great mystery here, but once again a kenotic theology of creation may be enlightening.³¹ For if theology remains true to its revelatory sources, it must also envisage the divine descent as the ground of creation itself. That is, even as a condition of there being any world distinct from God at all, the

31. See, for example, Moltmann, Jürgen *God in Creation*, Kohl, M.(trans.), San Francisco: Harper & Row, (1985), p. 88.

omnipotent and omnipresent Creator must be humble and self-effacing enough to allow for both the *existence* of something other than God, and a *relationship* to that other. If this other is to be truly other, and not just an accessory attached to God's own being, then the divine omnipotence and omniscience must become 'small' enough to allow room for what is truly distinct from God – though of course this self-constraint is paradoxically a function of God's greatness. It is out of the largesse of a divine humility, therefore, that the otherness of the world is 'longed' into being by God. Creation is God's 'letting be' of the world, a release that makes possible a dialogical relationship (and hence a more intimate communion) of God with the finite, created 'other'.

Once God's 'other', a world fashioned in accordance with the eternal Logos, has begun to emerge as a fundamentally *historical* reality, it can sustain its otherness only by becoming more, not less, differentiated from, its Creator.³² And once life emerges spontaneously within the historical unfolding of this other, it need not forfeit the seeds of autonomy allowed to take root in it by the other-regarding providence of its maker. It is ultimately for this reason that the Darwinian recipe consists of its three ingredients: contingency, lawful constraint, and time.

Contingency, for instance, may be troubling to those fixated on the need for design in nature, but it is absolutely essential for creation's autonomy and aliveness. The alternative would be a world so stiffened by lawful necessity that everything in it would be determined and dead – ordered perhaps, but dead. At the same time, the remorseless and impersonal invariance of the laws of nature, including natural selection (the second ingredient of the Darwinian recipe), may be essential if the world is to have any degree of autonomy or self-reliance vis-à-vis its Creator. The alternative, once again, is unimaginable: a construct in which every event would be directly caused by divine action – in other words, not really a world at all, but a puppet.

Finally, if nature is allowed to be distinct from the God who calls it into being, it must be granted sufficient temporal amplitude for life-evolving experiments with the wide variety of possibilities made available to it by the infinite resourcefulness of its Creator. Once we understand divine care as inseparable from the eternal divine descent, we may appreciate more readily why the creation of the world does not take place instantaneously but instead unfolds across billions of years. The God revealed in Jesus and his cross allows the world enough scope to become ever more distinct from – and thereby able all the more intensely to relate to – its creative ground. A mature theology of providence may come to realise that God 'descends' from all eternity so as to permit the self-actualising of the universe. Thus evolution, including all the aspects of it that send us scurrying for the safety of design, is consistent with any world whose emergent freedom eventually allows for the intimate relationship with the self-humbling God that Christian faith perceives to be transparent in the divine incarnation.

32. As Teilhard often notes, differentiation is an effect of, not a deterrent to, true union. See, for example, *The Human Phenomenon*, pp.186-187.

Providence as Promise

The evolution of life on Earth has required a nearly unimaginable expanse of time. In fact, it appears to some evolutionists that time, when there is an abundant amount of it available, is so creative that it renders God completely superfluous in the crafting of the many kinds of life. Nevertheless, even if evolutionists at times – inappropriately in my view – attribute a kind of causal efficacy to the immensity of time, evolutionary biology cannot give an adequate account of time itself. Darwinism neither asks nor answers the question of why the universe has been endowed with an irreversible temporal character at all. Obviously, irreversible time is a prerequisite for evolution, but evolutionary science does not ground or explain it. So any truly penetrating account of time's creativity in evolution must ask what gives the natural world the character of temporal becoming in the first place.

Evolutionists, unlike physicists and philosophers, seldom dwell on the cosmological conditions of temporality, even though without time evolution by natural selection would be inconceivable. Given enough time, they rightly point out, even the most improbable things can happen. But time must first be given! Why then is the universe temporal at all? The various sciences may try to answer this question at their own levels of inquiry, but a biblically guided theological search for the deepest conditions of time, and hence of evolution, could argue that it is *the coming of the future* that pushes the present into the past and permits a linear sequence of events to occur. In other words, it is not the blind movement of the past toward the future that endows the universe with its temporal character, but the constant arrival of a new future.

Theologically speaking, however, the 'coming of the future' is ultimately the coming of God, whose self-revelation occurs inseparably from promises that open up the world to an unprecedented horizon of newness. Indeed, it may not be inappropriate to say that, in its ultimate depths, the fathomless future is one of the things we mean when we use the word 'God' in a Christian setting.³³

The arrival of the future in the mode of promise explains in an ultimate way not only the fact of time, but also the other two ingredients of evolution's recipe, contingency and lawful predictability. The contingency in natural history, even when accompanied by pain and loss, is essential to any world open to the coming of the future. Try to imagine what nature would be like were it completely devoid of undirected, accidental events. It would be so frozen and rigid that it could never become new, but would persist in endless cycles of sameness. Nature could carry no promise or openness to creative renewal.

Likewise, the predictable constraints in nature that we call laws, including

33. See Moltmann, J. *The Experiment Hope*, Meeks, M. D. (ed. and trans.), Philadelphia: Fortress Press, (1975), p. 48; Rahner, K. *Theological Investigation*, Vol. VI, K. & K., Boniface (trans.) Baltimore: Helicon, (1969), pp. 59-68; Pannenberg, W. *Faith and Reality*, Maxwell, J.(trans.), Philadelphia: Westminster Press, (1977), pp. 58-59; Peters, Ted *God – The World's Future: Systematic Theology for a Postmodern Era*, Minneapolis: Fortress Press, (1992).

natural selection, are essential to the promissory bearing of nature. If it were devoid of the reliable and recurrent routines faithfully operative in its unfolding, the universe could have no narrative continuity from one stage to the next. At every moment it would crumble into disconnected droplets and disarray.

In the depths of Darwin's recipe, it seems to me, there resides what we may call the 'promise of nature'.³⁴ This promissory interpretation of nature, a synthesis of science and a biblical reading of reality, is not only consistent with evolution by natural selection, but it also sets forth an ultimate explanation of the contingency, necessity and temporal openness that permit evolution to take hold in nature in the first place. Our theological approach does not compete with the natural sciences but digs beneath their regional inquiries into the subsoil of a cosmic narrative graced throughout with an inherent openness to the future. Providence here takes the form not so much of design and fine-tuning as the perpetual dawning of a new future for the world. That the story of the Big Bang universe will itself eventually come to a physical end – freeze or fry – should not be disturbing to those who trust in God's promise of redemption. An infinitely compassionate and resourceful Future can be the ultimate redemptive repository of the entire series of cosmic occurrences no less than of those episodes that make up our individual lives.

Finally, although I cannot develop the point here, I would suggest that our search for the deep cosmic conditions of evolution may also provide a way in which the tradition of natural theology featured by the Boyle Lectures may undergo a renewal today. Instead of focusing only on the fact of living design, which can be accounted for scientifically in terms of the Darwinian recipe, a revived natural theology will focus on nature's openness to the future. In my view, the fact that the universe possesses a narrative character made possible by its inherent openness to an unprecedented future is the greatest of wonders. It is a wonder that we generally take for granted, but it runs much deeper into nature than does design. The theme of 'nature as promise' can bring the eschatological orientation of biblical religion into close consonance with Darwin's recipe. Darwinian evolution itself may not provide suitable soil for a natural theology centred on intelligent design, but it may very well provide the entry to a natural theology based on nature's narrative openness to the promise of an ever-renewing Future. Perhaps Robert Boyle himself – deeply Christian thinker that he was – would not be indisposed toward such a reconfiguration of natural theology after Darwin.

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34. I have developed this theme in my book *The Promise of Nature*, Mahwah, New Jersey: Paulist Press, (1993).