THE WORLD AS CREATION

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"What is it that breathes fire into the equations and makes a universe for them to describe? The usual approach of science of constructing a mathematical model cannot answer the questions of why there should be a universe for the model to describe. Why does the universe go to all the bother of existing?"

- *Stephen Hawking, A Brief History of Time*[1]

The language of creation has made an amazing come-back in recent years, and in the unlikeliest intellectual circles: that of physicists and astronomers rather than theologians and evangelists. It is curious that while an earlier generation of theologians abandoned biblical language for being supposedly incompatible with modern science, many of today's more famous scientists use biblical language freely in speculating on the implications of their work. But much caution is required. The concept of *creation* has come to mean different things to different people, both within and outside the Christian community. In order to sort out this semantic confusion, we need to pay attention first of all to the language of the Bible.

2.1 The Genesis Story

"In the beginning, God created the universe..." (*Gen 1:1*). So begins the Hebrew Bible. It may be taken as referring to the beginning of God's creative activity or - as most biblical scholars believe- as a title summarizing the account that follows. Either way, God is both the subject and the focus of the whole narrative. He is mentioned 34 times in 36 verses. The primary truth which it proclaims is theological: that the God who has acted in the recent history of the Hebrew people and entered into a liberating covenant-relationship with them is no less than the Creator and ruler of the whole universe.

In language of majestic simplicity, the writer portrays God's creative work in a series of pictures. The Spirit of God hovers over the world like a mother bird over its young, pointing to both the transcendence of God over his creation and also his intimate, caring involvement within it. Like any human craftsman, God "speaks" and "sees", "works" and "rests". The Word of God, which is his self-communication, is uttered into the void- and events happen and objects spring into being. The universe God creates is ordered and intelligible, because it has its origin in this uttered Word. To use later Christian language, the creative act depicted here is a Trinitarian act: God creates through the agency of Word and Spirit. In saying that the universe is created by God, the writer also indicates that the universe is open to God, not a closed system; it is open to new possibilities of transformation. God's relationship with his world is one of both loving intimacy and creative, commanding power.

The verb translated "create" (*bara*) carries considerable force in Hebrew. In the Old Testament it is used sparingly and only of God, not of humans or pagan deities. It testifies to the freedom and power of God: he is not bound by necessity to create a world. It is this idea that gave rise to the classic doctrine of creation *ex nihilo*, bringing being out of non-being, suggested in such passages as Romans 4:17 and Hebrews 11:3. God is not constrained (as in early Greek philosophy) by the rational and eternal forms of pre-existent matter. It means that what is brought forth- a *creation*- has to be understood on its own terms. Its patterns wait to be discovered, not deduced by rational speculation. But the freedom of God must not be

interpreted as the expression of an arbitrary will. He creates because self-giving *is* his being; his love "overflows" in bringing about a world that can share in the life of the divine communion. We shall explore in a later chapter the implications of this world-view for the development of science.

The literary structure of the narrative is a clue to its interpretation. We must not assume, in our modern arrogance, that the writer must answer the questions that we may ask out of our scientific interests: questions of *when* and *how* concerning the universe and the emergence of life. The purpose of the writer must be our guide in understanding the meaning of the text. The way the writer uses language tells us that his intentions are different. He makes use of symbolic numbers (e.g. 3,7,10,40) extensively: for example, 10 times "God said" (3 concerning mankind, 7 the rest of creation); the verb "to make" occurs 10 times; so does the phrase "according to its kind""; the verb "to create" is used at 3 places in the narrative and 3 times on the third occasion; we read 7 times the completion formula "and it was so", 7 times the approval "and God saw that it was good". The names of God appear 70 times in chapters 1-4 of Genesis, 40 times Elohim, 10 times as Yahweh (the name of the covenant) and 20 times Yahweh Elohim. This is evidently a highly stylized, carefully constructed narrative.

The "week" of creation is also built around a symmetrical structure. The following chart shows how the second half of the week parallels the first half- a familiar arrangement in Hebrew literature. So day 4 corresponds to day 1, day 5 to day 2, and day 6 to day 3. The first triad points to acts of separation or forming, the second to acts of filling. Or one can view them, from an earth-centred perspective, as the whole world arranged into "spaces" (the first triad) and their respective "inhabitants" (the second triad).

Acts of Forming	Acts of Filling
Day 1 : Light/ Darkness	Day 4 : Lights of Day & Night
Day 2 : Sea/ Sky	Day 5 : Creatures of Sea & Sky
Day 3 : Fertile Earth	Day 6 : Creatures of the Earth

This literary arrangement brings out the fact that God's world is an ordered structure (a cosmos), not a meaningless chaos. Also, the six-fold framework to describe epic events (written on six clay tablets, the commonest writing material of the period) was also a conventional literary style in the Sumero-Babylonian civilization of ancient West Asia. We also know that it was common practice to inscribe a "colophon", the ancient equivalent of a title page of a modern book, on the last column of each tablet. The refrain "there was evening and there was morning..." after each act of creation is an example of such a colophon. The study of ancient literary conventions has shed light on the way the text is to be appreciated. The value of Genesis as history has been amply confirmed by the accumulation of evidence from over 20,000 written texts that have survived from Babylonia since the time of Abraham. These texts, in turn, shed light on how to read Genesis as ancient West Asian literature.[2]

The "days" then, are normal twenty-four-hour periods but which the writer uses as a literary arrangement to serve a logical, rather than a chronological, purpose. Also, the expression "there was evening and there was morning", though an unusual way in Hebrew to express a twenty-four period or day, is the normal idiom for describing human labour: a day's work ends at early eventide and is resumed at the first light of dawn (cf. *Ps. 104: 23*). By choosing to depict God's

creative activity in the form of a working man's week, the writer is also able to affirm particular truths about the mutual relationships of God, the world and humanity- to which we shall return shortly.

Although most contemporary scholars endorse this literary interpretation of the week of creation (a variation of which is to read Genesis One as depicting the world as a cosmic temple, with the 7-day structure reflecting the common weekly ritual of temple inauguration climaxing in God coming to "rest" in his cosmic temple[3]), there are some who, in the history of the Church, have understood it differently. According to what is known as the "concordist" interpretation, the creation "days" represent vast epochs of time. The metaphorical use of day (as in *Gen 2:4*) or the timelessness of God's perspective (*e.g. 2 Peter 3:8*) are often quoted in its favour. Its supporters argue that this brings it into concord with modern scientific accounts of origins. However, it ignores the phrase "evening and morning" which occurs with the word "day"; and its harmonization with geology or astronomy is only superficial. For, if we were to take it chronologically, however long the time periods involved, then the order of creation is flatly contradicted by modern scientific theories (for example, the sun being formed after the earth and its vegetation).

Any literal (as opposed to literary) reading of Genesis One, which argues that the events described are to be taken as literally occurring in that order within a seven twenty-four hour week, runs into all sorts of problems within the text itself, leave alone with geology and astronomy! The sun and the moon are created three days after the light, though the Hebrews knew as well as we do that light comes from these heavenly bodies (cf. *Ps 104:19-22*). And what are we to make of the lack of the "evening and morning" refrain on the seventh day? Our reason for rejecting this literal approach is not due to any modern scientific considerations. Without bringing science in at all, we have simply paid attention to literary "clues" within the text which help us identify the author's intentions and interests. This is a carefully constructed narrative, full of intricate artistry. A literal approach flattens the text and obscures its message. It is not the mechanisms and processes of creation that interest the author, but what creation tells us about the nature of God and his dealings with humankind.

This view is reinforced when we consider, as we must, the place of 1:1-2:3 (which is the real unit in the Hebrew text) in Genesis as a whole. The book falls into ten major sections. Each section has a title announcing what is to follow (usually in the form "this is the family history of X"). Gen 1:1-2:3 stands outside this organization. It is a grand "overture" to the whole book of Genesis which traces the tragic spiral of human sin and God's plan of deliverance and restoration through Abraham and the patriarchal line. Although of little importance in the world of their day, the latter were incorporated into the redemptive purposes of Yahweh who was not a mere tribal deity but the God of the whole universe. Thus, the literary approach to the "week" of creation does most justice to the integrity of the text and its background.

Returning to the unfolding creation narrative, observe that the world is created rich in diversity. The Creator blesses living beings with semi-autonomy, the capacity to "pro-create" (*v.22*). Creatureliness, individuality, diversity and change are all pronounced "good" by the Creator. He takes delight in what he brings into being. The sovereign Lord of creation speaks, and the creation responds (e.g. *v.24*). The earth must produce cattle, creeping things and wild animals. The waters must give rise to the swarming activity of sea creatures. In other words, the creation is equipped by the Creator to bring forth novelty in obedience to the Creator's call. The writer implicitly recognizes what philosophers today would call "secondary causes": note that while, in v.24, God declares "Let the earth bring forth living creatures", the next verse concludes, "So

God made the animals". This is a creation that continues to make itself under the sustaining power of the Creator. Other biblical passages such as Psalm 104 and Job 38-41 expand the thought of Genesis One, showing in delightful picture-language God frolicking with his creatures and calling forth their awesome powers.

The whole universe, then, is distinct from God yet dependent on God for its existence and sustenance. All its wonderful capacities for renewal, adaptation and development are built into it by the Creator, but all these complex systems and patterns work in response to the divine Word. Moreover, the fact that God not only creates time, but creates *with* time and *in* time would have had profound implications for ancient Israel, as indeed it does for modern society. Israel would learn to value time as the fabric of history in which God is involved. Redemption, unlike in other religious world-views (including Hindu and Buddhist thought), will function *within* time and not as a deliverance *from* time. The Creator personally engages with his creatures in their striving towards the goal of a perfected creation.

That an "evangelistic" and polemical intention lies behind the Genesis creation narrative becomes clear when it is read against the backdrop of the popular beliefs and practices of Israel's neighbours. While employing literary forms found in the creation myths of other cultures, the content of the narrative is deeply anti-mythical in its thrust, as we shall see. It repudiates many popular religious ideas of the first and second millennium BC. A seventh century Babylonian or a Canaanite in fourteenth century Ugarit (both centres of great civilizations) would have been shocked by the teaching of Genesis. It is a powerful witness to the uniqueness of Yahweh, the Lord of creation.

For instance, we note the following striking contrasts:-

(a) *Theism vs polytheism*. There are no rival gods nor helpers in the work of creation, unlike in every other religious epic about origins. The latter narrate the birth of the gods, their loves and their battles. No one is ultimately in control of the world. Its fortunes depend on which deity is currently in the ascendant. The gods (as in Hindu mythology) are personifications of various aspects of nature, and nature itself is deified as a living goddess who nurtures all living things and exacts a terrible vengeance on all who fail to worship appropriately.

Why does the writer put the creation of the sun and the moon on the fourth day, after the creation of light, when it would have been obvious to everyone that they were the sources of light for the earth? The reason becomes obvious when we recall that the worship of the sun and moon was very common in the writer's world (e.g. the great Chaldean city of Ur where Abraham came from was a famous centre of moon-worship). Also, then as now, many believed that human life was controlled by the motion of the moon and the planets. The sages of Babylonian kept detailed records of heavenly motions for the construction of astrological charts. Political decisions depended on the accuracy of such charts. It is not uncommon to find politicians, business leaders and even university teachers in South Asia for whom horoscopes and "auspicious days" are more real than anything in modern culture; and one suspects that this may also be true of some of their counterparts in the West. The Genesis narrative "de-bunks" this superstition. The heavenly bodies are simply creatures of God, lamps hung in the sky, with no divine power of their own. They are neither to be feared nor worshipped. Nature is but a fellow-creature with human beings: both are dependent on and nourished by the Creator alone.

(b) *God's word vs cultic ritual*. In many societies, the powers of chaos and evil were warded off by the magical incantations of special religious "manthras" (e.g. the popular *pirith*

ceremonies in Sri Lanka and other Buddhist countries today). These human words, accompanied sometimes by appropriate actions, were believed to sustain the stability and fecundity of the world. But what does Genesis teach? It is the Word of God, not human words, which ensures the stability and continuing fruitfulness of the world. This radically "de-mythologizes" the reigning religious worldviews.

(c) *A good creation vs a capricious, even evil world*. Once again, contemporary worldviews would have understood "salvation" as an escape from the sensory, empirical world of human existence. There was no value or purpose attached to the physical realm of space-time events. Meaning was to be sought in detachment from the external world which, in any case, was less real than the "spiritual" realm. This view is contradicted by the doctrine of creation which sees the world as possessing an intrinsic worth and meaningfulness (though later corrupted and disfigured by evil- cf. *Gen 3*) because it stems from the rational will of a good and loving Creator. Existence itself is declared blessed.

(d) *Humans, the crown of creation, vs Humans, an "accident"*. The teaching on humankind given in the opening chapter of Genesis is utterly unique. Unlike the common religious creation-myths which depicted man as an "after-thought", an "accidental" offspring of the gods, the entire narrative of Genesis 1 builds up to a climax in the account of human creation. That this is a turning point in the story is brought out by the author in three ways: (i) the language shifts from the repetitive "Let there be..." to the more self-reflective "Let us make..." (*v.26*); (ii) the self-deliberation is then followed by the act of creation (*v.27*), showing perhaps the deeper involvement of God in this aspect of his creative work; (iii) the fact of human creation, male and female, is repeated three times in the same sentence (*v.27*)- an example of poetic Hebrew parallelism.

Observe too that God commands human beings (*v.28*) to be fruitful. This stands in marked contrast to the fertility cults of the surrounding nations, in which the worshippers sought to persuade the gods to be fruitful. Life is a gift from God. His blessing confers both gift and task.

(e) *Humans, the Image of God.* What this chapter teaches concerning humankind is startlingly revolutionary. The stone or metal image that an ancient king set up was the physical symbol of his sovereignty over a territory. It represented him to his subject peoples. But here, it is humankind that constitutes the "image of God" (*v.26, 27*). It is humans who represent God on the planet Earth. It follows that when human beings fashion images out of the created world and worship them, they worship something inferior to them and thus de-humanize themselves. It also follows that the way we treat our fellow human being is a reflection of our attitude to the Creator. To despise the former is to insult the latter (*cf. Prov. 14:31; Jas. 3:9*). And it is not only the kings and powerful lords of the earth who constitute the image of God, but all people everywhere. Observe too that it is men and women together who are created as God's "image", and so women are called to rule the earth alongside men. This high view of woman was unique among the cultures of the time, and has remained unique well into the modern age.

If we follow the majority of Old Testament scholars who date the final text of Genesis to the time of the Israelite exile in Babylon, then the politically subversive (and hence liberating) character of this doctrine of humankind becomes especially apparent. For Babylonian society, like both other Mesopotamian and Egyptian civilizations, was hierarchically structured. At the top of the social pyramid was the king, who was believed to represent the power of the divine world. Just below him came the priests who shared his mediatorial function, but to a lesser degree. Below them were the bureaucracy, the merchants and the military, while the base of

the pyramid was formed by the peasants and slaves. Thus the socio-political order was given religious legitimation by the creation mythologies of these societies. The lower classes of human beings were created as slaves for the gods, to relieve them of manual labour. And, since the king represented the gods on earth, to serve the king was to serve the gods. Consequently, the Genesis "counter-myth" undermines this widespread royal ideology. It democratizes the political order. All human beings are called to represent God's kingdom through the whole range of human life on earth. And, as we shall see later, God's rule is not the monarchical rule of a despot, but the loving nurture of a caring parent.

Thus men and women, according to the Genesis narrative, possess a dual nature. They are *creatures*, belonging to the rest of the animal kingdom: created on the sixth day, along with all the other creatures of the earth, and (in the following chapter) said to be formed "from the dust of the earth", pointing to our human creatureliness (as if to say, "they didn't drop from heaven like some immortal gods") and our relatedness to the earth. Modern science helps us to understand our connections with the rest of creation: our bodies are made up of chemicals that were cooked in the interior of stars a very long time ago, we share most of our DNA with other living organisms, we live on the exhalation of plants, and our well-being depends on the maintenance of sensitive balances in the biosphere. The earth is our natural home, and other earth-born creatures are our fellow companions on this planet.

But the other side of the truth about us is equally clear and vitally important: humans alone are stamped with the image of the Creator, called into a *personal* relationship with him which defines human life as more than merely biological. Human beings alone are addressed by God. To the Creator, we exist not only as his objects but as subjects. Human uniqueness consists not in the fact that we talk with each other, rather that God talks to us and invites us to reply. In other words, *we are invited to become part of the conversation that is the divine life*.

Moreover, just as God has his being as a communion of Persons, so human being is constituted as persons (beings-in-relation). Just as God is related to us and at the same time remains other than us, so within the human community we are related in diversity. Personal freedom implies a space between each other that is to be respected, and yet we do not find our fulfilment as persons apart from God and one another. Thus the "other", far from being a threat to my unique identity, is the one without whom I would have no identity. We alone are treated as moral agents, commanded by the Creator and held morally responsible to him in our actions. Humankind is also called to be "sub-creators" under the sovereign Creator in enabling the whole creation to flourish and reach its appointed fulfilment in time.

The revolutionary uniqueness of this view of human life is felt not least in our modern societies. We mentioned earlier Peter Singer and Helga Kuhse's assault on the Christian prohibition on infanticide. For them human beings are defined by what they *possess*: self-awareness, self-control, a sense of past and future, and so on. Simply being a member of the biological species *homo sapiens* is not enough to make one a bearer of human rights. Thus human babies, and especially those who are mentally defective, do not count as human persons who have a moral claim on us. They conclude that "to allow infanticide before the onset of self-awareness... cannot threaten anyone who is in a position to worry about it."[4] Any argument that defines humanness in terms of what we *have*, rather than what we intrinsically *are*, can also be used to justify the killing of any adult suffering from the loss of the relevant function.

God is mystery, and man and woman in God's image are mystery. When we stand before another person, however destitute, disabled, diseased or degraded, we stand before someone

who is the vehicle of the divine, someone who, in Martin Buber's classic terminology, is a "Thou" and not an "It". Those whom we treat with reverence as persons become known to us eventually as persons. We can acknowledge the gradualness of development into personal encounter, while affirming the reality of personhood from the moment of human conception.[5]

We can and do, of course, treat people like "its", as simply physical objects- for instance, in pornography, in reductionist scientific theories (see, later, Chapter 6), through non-therapeutic experimentation, or by indiscriminate killing in warfare. We do so at loss to our own humanity. The death of God does not, as Nietzsche believed, lead to the glorification of man; but rather takes from men and women any claim they may have to be treated with reverence by their fellows. The Genesis story goes on to show how, when the man and the woman sought to become gods, rather than gratefully accept their unique dignity as the image of the only God, they perceived the other as both a threat to each one's autonomy and as an object to be manipulated in a world of manipulable objects.

Hence, Genesis presents us with an alternative vision to those thinkers who start with an autonomous self and not with God. The moral implications of this vision is finely expressed in the words of the French biologist, Jean Rostan: "For my part I believe that there is no life so degraded, debased or impoverished that it does not deserve respect and is not worth defending with zeal and conviction... I have the weakness to believe that it is an honour for our society to desire the expensive luxury of sustaining life for its useless, incompetent and incurably ill members. I would almost measure society's degree of civilization by the amount of effort and vigilance it imposes on itself out of pure respect for life."[6]

(f) *Universal vs chauvinistic nature of religious epics*. The creation epics of the surrounding civilizations were designed largely to explain why the local god of that city/civilization was currently in the ascendant (as, for example, the triumph of Marduk, the god of Babylon). But there is no mention of Israel or the Hebrew people in the creation account of Genesis. Uniquely blessed though they may be in receiving this revelation from the Creator, they are not inherently different to other peoples. All are creatures made to image God. There are no distinctions of language, race, caste or class mentioned in the text. The only distinction within humankind is that of male and female, but it is a distinction that is anchored within an equality of status.

Since the idea of humankind "ruling over the earth" (*v.28f*) has been used by certain anti-Christian writers in recent years to accuse the Bible of encouraging environmental destructiveness, a few brief comments on this issue may be appropriate here. Typical of those who have made this charge is the late Arnold Toynbee who claimed that "the recklessly extravagant consumption of nature's irreplaceable treasures, and the pollution of those of them that man has not already devoured, can be traced back to... the rise of monotheism... Monotheism, as enunciated in the book of Genesis, has removed the age-old restraint that was once placed on man's greed by his awe. The directive given in the first chapter of the book of Genesis... has turned out to be bad advice, and we are beginning, wisely, to recoil from it."[7]

Such fanciful interpretations of history, especially when they come from a historian of the stature of Toynbee and are stated dogmatically with no shred of supporting evidence, can only be due to a prior antipathy to biblical Christianity on other grounds. Comments such as his may fuel the anti-Christian bias and the romantic view of non-Christian societies that have accompanied the disillusionment with science and the notion of progress in the post-Christian West. But they make strange reading for those of us living in non-Christian cultures which have not been tainted by the monotheism of Genesis and yet suffer the crippling effects of

environmental damage - the pollution of air and water supplies, the disappearance of rain forests, desertification and soil erosion- whether due to poverty, neglect, civil war, political corruption or blatant commercial greed (not all of which can be laid at the feet of Western corporations and governments). The pollution and pillage of nature, whether as a result of ignorance, greed or selfishness has been characteristic of human cultures all over the globe and at all times in the past.

Joseph Needham's monumental studies on Chinese scientific and technological development[8] reveal how Chinese technology wreaked ecological destruction on a massive scale. Even Buddhists contributed to soil erosion and deforestation in the building of their temples all over Asia, and the eminent microbiologist and environmental campaigner Rene Dubos observes how "the classic nature poets of China write as if they had achieved identification with the cosmos, but in reality most of them were retired bureaucrats living on estates in which nature was carefully trimmed and managed by gardners."[9] Dubos' verdict is that "If men are more destructive now than they were in the past, it is because there are more of them and because they have at their command more powerful means of destruction, not because they have been influenced by the Bible. In fact, the Judaeo-Christian peoples were probably the first to develop on a large scale a pervasive concern for land management and an ethic of nature."[10]

Is it conceivable that the Creator, having repeatedly in the text declared his pleasure and delight over his creation, should now turn to the crown of his work and command them to destroy that same creation? The fallacy in the reasoning of those who blame the environmental crisis on Genesis is simply that they do not listen to the context in which the command is embedded. We read into words like "ruling" and "dominion" our fallen, self-centred experience of human rule: namely, one of tyranny and exploitation. But humankind created as God's image is to rule as God rules; and we have seen how God's rule over the cosmos is depicted in this same chapter as one of ordering, life-generating, life-preserving, servanthood and personal enjoyment.

Moreover, in the following chapter of the Genesis "counter-myth", the man is put in a garden (representing the whole earth) and called "to work it and to care for it" (*Gen 2:15*). He also names the animals, the name in ancient thought capturing a creature's essential nature or character and so implying intimate knowledge. Thus, the earth and its creatures are entrusted to human care, and we have a mandate from God for study, work and the enrichment of life on the planet. We are neither its owners (to do with it as we please) nor mere guests (to passively behold but not to intervene in natural processes). The nature of our "rule" is defined for us: it is one of serving the earth by enabling it to bloom. Developing the earth's potential and conserving its fruitfulness are twin aspects of responsible planetary stewardship. An ethic of *flourishing* (or well-being) goes hand-in-hand with an ethic of *preservation*.

Wild nature, in all its awesomeness and strange majesty, is our metaphorical mother and therefore deserves moral respect.[11] Both the life-generating ecosystems that gave humans birth and also the other sentient creatures that share the planet earth with us constitute an interlocking web of life. The evangelist Mark's image of Jesus "with the wild animals" (*Mk 1:13*) provides, as Richard Bauckham notes in an essay, a particularly apt symbol for our ecologically sensitive age.[12] It comes on the heels of Jesus' identification as the messianic Son of God (*1:11, cf. Ps 2:7*) and his victory over Satan; and it needs to be read against the background of Old Testament eschatological hopes, as expressed in Isaiah 11:6-9 (following the description of the coming Davidic Messiah in *v.1-5*), Job 5:22-23 and Hosea 2:18. In Jesus the messianic reign has dawned, and this reign includes the healing of enmity between humankind and the wild animals. Human dominion, which was perverted into domination and mutual alienation by

human sin, will be restored; and in Jesus' peaceful companionship with the wild animals we are given a foretaste of that eschatological restoration. Bauckham observes that Jesus neither terrorizes nor domesticates the wild animals. He is simply with them. And in that pregnant phrase "with the wild animals" Mark gives us a powerful reminder of the value of the non-human creation in the eyes of God. Human dominion, restored in Jesus (the new Adam), enables the wild animals to find their appropriate place in the wilderness as creatures who share God's world with us.

Returning to the Genesis story, the "week" of creation finds its ultimate goal, not in the creation of mankind, but in the "rest" of God (*v.31*). Obviously this cannot be taken literally as God's non-action, for if God were to be inactive for even a moment the entire universe would cease to exist! When asked why he healed on the day of Sabbath rest, Jesus answered the Jewish leaders, "My Father is always at his work to this very day and I, too, am working" (*John 5:16ff*). What then is the theological intention behind this language? Bearing in mind the focus of the writer on the inter-relationships between God, humankind and the world, we can suggest the following:

(i) God's relationship with the world is not one of total *absorption*. Though involved in his creation and deeply entering into his work, nevertheless he is not defined by his creation (as in the philosophy of *pantheism* which speaks of God and the world as co-equal aspects of a single reality). God's being is not exhausted in his work. He can step back, so to speak, and behold his handiwork with the joy of the seventh day. It is the joy that all human sub-creators (to employ a term popularized by C.S. Lewis and J.R. Tolkien) share when we bring something of beauty and value into the world (whether another human life, a painting, a musical lyric, a mathematical theorem, a scientific theory, a book, and so on). Thus, the creation enjoys a certain measure of autonomy while remaining dependent on the Word of God. The basic processes and structures of the world have been so patterned that, in due time, they will perform the functions for which they were called into being. History, natural and human, has now begun.

(ii) Human work too is *relativized*. We find our true identity not in our work of ruling the earth, but in God. We are created for relationships, primarily with our Creator. Work is an aspect of our worship to God, but it is not the whole of it. Pausing to enjoy the fruits of our labour with our fellow human beings and to give thanks to God for the gifts of life- this is what restores the true perspective on our work. So leisure is built into the created order. It is as much God's calling as is work. This was the basis of the Sabbath law in ancient Israel. Its primary intent was to set human labour within the only perspective which gives it meaning: namely, the worship of God. It is still a revolutionary concept to follow in an age devoted to the frenetic, soul-destroying idolatry of work.

There are many more theological and ethical treasures one could quarry out of the opening chapter of Genesis. It is one of the world's most remarkable pieces of literature. It affirmed a radical theistic outlook in the face of empty religious systems, whether of polytheism, astrology and occult practices, pantheism, dualism and animism. Even today, its teaching stands as a bulwark against all those modern world-views which enslave human life: e.g. *naturalism* (that the universe is a closed system of causes and effects, with matter-energy defining all that is real), and its daughters *relativism* (there is no truth that is true for all, no moral values that are binding on all, because universal values derive from a universal purpose and there is no purpose to human life or the universe) and *subjectivism* (there is no truth outside one' own experience). There are rich implications for the modern world, whether in the areas of human rights, the

basis for science and technology, the dignity of work, the care of the environment or the stewardship of the earth's resources. Some of these will be explored in subsequent sections.

The main point I wish to make at this stage is simply that by asking the wrong kind of questions about the opening chapters of Genesis, namely questions to satisfy our scientific curiosity, we actually blind ourselves to the real questions the text puts to us: questions that challenge our world-views and our ultimate commitments in life.

2.2 Creation Language, Science & the World

The biblical doctrine of Creation asserts that every event in our space-time world owes its being (or, in philosophical language, its ontological origin) to the activity of a transcendent, wise and sovereign Creator who is also at work within that space-time world which he sustains. Creation language does not refer merely to an event in the distant past, whether of the universe or of human life, but rather to the ultimate origin of all events, past, present and future. The source and goal of all existence is in God. But this God is not a being in the ordinary sense of the word. He does not exist as a tree or a galaxy or even a human being exists. When we normally assert that something exists, we mean that it can be found within the space-time world. But clearly God is not found as an item within the mysterious and wonderful contents of the universe. He precedes all "existents" by being the condition of their existence, so that his mode of being transcends the being that is exemplified by the objects we encounter in space and time. It is surely significant that the Bible does not begin with the claim that God exists, but rather that he brings beings into existence: "Let there be..."

It follows that the world itself is not eternal; nor is it a self-existent, self-sufficient system. It is unceasingly dependent on the creative will of its Creator. "In his hand is the life of every creature, the breath of all mankind" (*Job 12:10*). This sums up what the language of Creation seeks to convey. If God were to withdraw his presence from us for an instant, we would simply collapse into nothingness. We would cease to be. And what is true of us is true of every event and entity that we may encounter in the universe. God does not simply trigger off the initial impulse and then leave the universe to unfold according to some impersonal blueprint. That notion of a First Cause or Prime Mover is not a biblical one. It first came from the ancient Greek philosopher Aristotle and was popular in eighteenth-century Europe in the form of *Deism*, a "natural religion" that often envisaged a Divine Architect or Mechanic, launching the whole process we call the universe, but active nowhere else. Unfortunately, many Christians as well as most non-Christians today think of creation in these terms, and it is this that leads to so much confusion.

We should also never think of God's activity as some kind of intrusion, an "interference" in this world of space-time. Though we saw that the world is endowed with procreating powers and real capacities to bring forth change and novelty without some direct, "special" act of God, both its being and its capacities to so act are gracious gifts from the Creator, and they are continuously sustained by his will and enabling. His activity undergirds all activity. Every event in the space-time fabric that we call the universe is linked "horizontally" to other events within space-time and "vertically" to the sustaining activity in eternity of the Creator. Every event- whether the birth of a flower, the death of a star, the flight of a bird or the firing of neurons in my brain... - owes its existence to the Creator's power. The world exists in radical dependence on God; he does not "exist" as an object in the world. This is where all our thinking must begin.

We have seen how the picture-language of Genesis 1 introduces us to a God who brings order out of chaos, so that the world emerges as a cosmos and not as a meaningless jumble of events. God commands ("Let there be"...) and events leap into being. His word stamps the universe with order, it pronounces as "good" the emergence of change and diversity, living and non-living matter. It expresses the Creator's joy over all that he chooses to bring into being.

So it is with all acts of creation. Think of a human novelist or poet. He begins with an idea, conceived in his mind, which he then embodies in written or spoken words. As he proceeds to speak ("Let there be such-and-such..."), events and characters spring into existence. As the story unfolds, its intelligibility is grounded in the intelligence of its creator. A great novel even assumes a life of its own. All creative writers testify to how new (unplanned) situations arise from the work itself as they labour over it, and to which they then respond. Similarly the Bible invites us to view the world as God's historical epic, involving human characters whose stories are still in the process of being written. It is an unfolding cosmic drama in which the Triune Creator is intimately involved with his creatures.

This analogy of artistic creation serves to illustrate the biblical dynamic of *transcendence* and *immanence* in God's indwelling of his world. The artist is radically Other to the world of his work, but nevertheless puts something of himself into his work, so that although he transcends it in giving it a measure of independence, it can also be regarded (in a certain sense) as an expression of his personal being. Like all analogies, however, it does not do justice to the manner in which the divine author *humbly stoops to let himself be affected by the actions of his creatures and to invite them to share with him in the construction of their life-narratives*.

From our perspective, as creatures within this cosmic drama, the story is open-ended: we are free agents whose thoughts and actions within this space-time world shape the future of that world. Made in the image of God, our freedom has not been taken away by the Creator despite the fact that it has been abused. The Creator still takes up our voluntary actions, whether good or evil, into his purposes for the world. We do not need to go beyond the book of Genesis itself to see examples of this mysterious interweaving of human responsibility with divine sovereignty.

For example, consider the Joseph stories which take up the last quarter of the book. The narrator traces Joseph's adversity to various complex sources: his own childish arrogance, his father's favouritism, his brothers' jealousy which prompted them to sell him as a slave to Pharaoh's court, Joseph's loyalty to Yahweh and to his employer Potiphar, the latter's poor judgment in choosing to believe his wife rather than Joseph, the thoughtlessness of the chief butler, etc. In Joseph's imprisonment and later exaltation, Yahweh is acting for the preservation of his people in accordance to his promises to Abraham, Isaac and Jacob (*Gen 45:8 & 50:19, 20*). It is only when we come to the end of the story that we can see how Yahweh achieves his sovereign purposes *through* the complex, inextricable causalities of human existence. The brothers of Joseph are not conscious of having been coerced or manipulated to act the way they did; indeed they recognize their culpability (*50:15ff*). But Joseph not only forgives them, but is himself humbled by the realization that, "you intended to harm me, but God intended it for good to accomplish what is now being done..." (*50:20*). It is *not* that good is inherent in evil or emerges automatically from evil (for that belief would cut the throat of all human morality), but rather that the sovereign Creator, who is the Lord of history, can overrule the evil actions of his creatures to bring forth good.

God works simultaneously through, beyond, and in spite of his creatures' actions. So we need neither be idealistic about human history (as if all human actions were manifestations of the divine will) or cynical about human history (as if all human actions were insurmountable obstacles to the divine will). This confusion between the levels at which divine and human action operate, as well as a failure to grasp the ambivalent nature of all human achievements - for every human being is *both* created in the image of God *and* a fallen sinner- has led to meaningless conflicts between Christians and to tragic misunderstandings of the Christian message (as, for instance, among Marxists and Buddhists).

Evil itself is left unexplained in the Bible, for perhaps the very good reason that it *is* inexplicable. The moment we "explain" it we have related it to a meaningful framework within which it now "makes sense". But the whole point of evil is that it does *not* make sense. It is insane, an absurd intrusion into God's good creation. To explain it is to explain it away. That is why every attempt to explain evil, as in Hindu and Buddhist doctrines of *dukka*, *karma* and rebirth, only ends up trivializing evil. When the category of *dukka* is employed to embrace everything from the sense of human finiteness to sorrow felt in the loss of a loved one to the brutalities of Auschwitz or Pol Pot's Kampuchea, the latter are robbed of their horror. In fact the feelings of shame, shock and revulsion that we experience when we see or hear of such atrocities (and which, in a biblical perspective, indicate a normal and very healthy response) are themselves part of the *dukka* from which we are told we need to be liberated.

While on the subject of Buddhist explanations of evil, I cannot help thinking that at the heart of Buddhism there lies a major confusion over the concept of creation. It seems that the Buddha understood creation as implying a fatalistic attitude to life. We read, for example, in the *Anguttara Nikaya (III:61)*: "So, then, owing to the creation of a supreme deity men will become murderers, thieves, unchaste, liars, slanderers, abusive babblers, covetous, malicious, and perverse in view. Thus for those who fall back on the creation of god as the essential reason, there is neither desire, nor effort nor necessity to do this deed or abstain from that deed". It is against the doctrine of creation as taught by some Hindu schools of philosophy that the Buddha appears to be reacting. So, in order to safeguard human responsibility it was thought necessary to dispense with God altogether or, at least, to keep "God-talk" to a minimum. Moreover, if "God" is conceived simply as a First Cause, then, since Buddhist thought posits endless cycles of formation and dissolution with no beginning, such a concept is, at best, redundant, and at worst, meaningless. This remains the biggest obstacle to a Buddhist's understanding of Christian language about the Creator- and, sadly, most Christians have not helped to bridge the communication barrier because they themselves have been imprisoned in their thinking by Greek, Hindu or naturalist notions of causality.

2.3 Questions About Origins

We need to be careful, then, not to confuse the language of Creation, which speaks of *ontological* origins, with the language of scientific theories, such as Big-Bang cosmology or neo-Darwinian evolution, which are attempts to unravel the *chronological* origins and development of the universe and of life. Creation-language addresses different, more profound, questions: e.g. why is there a universe at all- and not nothing? Is there any meaning or purpose to this whole cosmic drama? How is science possible at all? What is humanness, and what, if any, is its significance?

This is not to deny that scientific theories carry philosophical implications. They may also enlarge our understanding of how the Creator interacts with his creation and sharpen the

language we use in discussing that interaction. But I can see no reason, on biblical grounds, for preferring "Big Bang" or "inflationary" models to "steady-state" models in cosmology or for rejecting any physico-chemical explanation of the origins of life on earth. We can criticize these on scientific grounds (and there are weaknesses in the Darwinian paradigm of evolution as well as in all present cosmological models), but both Christians and atheists make a logical blunder when they confuse the two types of questions that can be raised about origins.

The Big-Bang scenario was predicted by Einstein's General Theory of Relativity which depicted gravity as a curvature in the space-time fabric of the universe. When the equations were solved, what are known as mathematical "singularities" emerged. These singularities represented points at which the curvature of space-time became infinite (or, in other words, the density of matter was infinite). Localized regions in the universe in which such singularities appeared were called Black Holes, while the singularity which gave rise to the expansion of the universe itself was picturesquely dubbed the Big Bang. Present calculations locate this event at fifteen billion years ago, give or take a couple of billion. It is this singularity, at which all the known laws of physics break down, which scientists such as Stephen Hawking and others refer to as the "moment of creation". It is at this point that "God", or "the creator", is sometimes invoked. However it is important to note that this is simply the god of Deism (see above), though clothed in a more sophisticated scientific dress.

This is made clear by Hawking's argument that if the mathematical singularity could be removed from the model, then talk of "creation" would be unnecessary. By combining quantum physics with General Relativity theory, Hawking believes that he has demonstrated that space and time can form a finite, bounded surface with no singularities or boundaries, like the surface of a sphere but in higher dimensions. This model could explain both the large-scale and small-scale features of the universe, including the arrow of time. Speaking of this "no boundary" proposal, Hawking writes: "So long as the universe had a beginning, we could suppose it had a creator. But if the universe is really self-contained, having no boundaries or edge, it would have neither beginning nor end; it would simply be. What place, then, for a creator?"[13]

The analogy of human creation which I used earlier reveals the philosophical error in this kind of reasoning. The author may be writing a novel on an August morning in 1895, but the events of his story may be spread over several decades, even centuries, and his characters may either make their appearance all at once or (what is more usual) at various stages in the narrative. But no amount of discontinuities in the story can be used to argue either for or against the existence of the author. The temporal origins of events in the story are (conceptually) distinct from the *ontological* origin of the story in the author's thought and will. It is the work *as a whole* that demands an explanation: is someone responsible for this or not?

Various New Testament passages bring out this coherence and dependence of the world on the eternal Word of God, identified now with Christ (*e.g. Col. 1:15; Heb. 1:3*). In his book, *The Clockwork Image*, the late Donald MacKay gave a very helpful, though limited, analogy of Christ's "holding all things together". He invites us to think of an artist painting a picture, but who uses, instead of conventional paintbrushes and a canvas, an electronic gadget with which he can throw any picture he desires on to a television screen. As in all TV receivers the picture is formed by electrons impinging on the screen and producing a flash of light. If the electron beam is controlled by a regular sequence of signals, the impact of electrons forms a stable pattern of light and shade. This is an example of dynamic stability. Billions of events are taking place, but they express an underlying order, a coherence that gives stability to the whole. This coherence depends on the artist's faithfulness to the idea he wishes to embody in the electronic

signals that make up the whole picture. If he were an arbitrary, capricious creator, the picture would fluctuate chaotically from one moment to the next.

Let us suppose that the artist has chosen to depict the World Cup football final. If you have a scientific habit of mind, you would notice that every time the ball is kicked into the air it follows a parabolic curve. You may be able to deduce laws of motion, theories of gravitation etc. You can build up a chain mesh of cause-and-effect and, on the basis of that, make reliable predictions concerning the movements of the ball. If anything unusual happened you would be puzzled and look for an explanation. For, if a dependable artist is indeed "upholding" the game in existence, then it is natural to expect that all events, however out-of-the-ordinary, should fall into some coherent pattern. In other words, it is your prior knowledge of the artist's trustworthiness (gained through intuition or personal "disclosure", rather than your science) that gives you the expectations that make the practice of science possible. We shall return to this theme in chapter 6.

Let us remain with this model of the electronic artist. Suppose that you are exploring, with a scientific habit of mind, the regular pattern of events that form the image of a football game. Imagine that something extraordinary happens: for example, the ball when kicked does not follow its customary parabolic arc but simply disappears into outer space! Can one deduce from this inexplicable event that there is an artist responsible for the picture? That would clearly be illogical. For *every* event on the screen, what we regard as the "normal" no less than the "abnormal", owes its being to the artist. He is sovereign over the ordinary events as well as the extraordinary. What we would call the "normal course of events" is simply a description of the artist's normal mode of working. But if he is responsible for his creation, then he is free to do the unprecedented.

What Christians call the "miraculous" (actually, the term itself is not a biblical one) are the out-of-the-ordinary acts of the Creator. But they are never irrational, meaningless events. They serve a higher purpose, but that purpose cannot be deduced by modern scientific enquiry which deals only with quantifiable regularities in the natural world. Rather, it is given to us by a word of explanation from the Creator himself (this is what some theologians refer to as "revelation in word-acts").

Thus the "miracles" of Jesus, for instance, were never meaningless acts to impress the gullible, but they are regarded as *signs* in the Gospel narratives: acts of compassion and power which point beyond themselves to the way God's liberating rule which overcomes evil is taking shape in the person and ministry of Jesus. They are a foretaste of that new humanity, a new world that is coming into being through his death and the resurrection. The resurrection of Jesus itself is never portrayed as simply a "man coming back to life", but rather as a *sign* of God's new creation and a reversal of man's bondage to sin, evil and death. It would have been a meaningless event if part of any other man's life, but seen against the dramatic events of Jesus' life, and especially the claims he made concerning himself, it made perfect sense. So we should not fall into the common mistake of identifying the "miraculous" with the "irrational". Their rationality can only be discerned within a wider conceptual framework than the scientific.

If God is the sovereign Creator, he is free to by-pass his "normal" mode of activity whenever and wherever he chooses. We have seen that the order and stability we expect of our world, and without which it is impossible to live, are guaranteed by the Creator's trustworthiness. He is not capricious. He does not play fast and loose with his creatures. But within that order and

stability, there is always newness: fresh surprises that enlarge our vision, disturb our complacency and humble our pride.

2.4 "The God of the Gaps"

Many people, including some very clever scientists who are philosophically illiterate, think of God as a rival to a scientific explanation of events. Where science cannot explain something (e.g. how living cells are formed from non-living macromolecules, why the early universe had the structure it did, and so on), "God" is invoked; and where science can give a complete explanation, "God" is jettisoned. This kind of God, whether believed in by Christians or anti-Christian atheists, is known as the "god-of-the-gaps". It occupies the gaps in scientific knowledge, so that as scientific knowledge expands, the area over which this god rules shrinks in size. The picture of the electronic artist shows the absurdity of this view, not only with regard to divine activity but also regarding science. Scientific knowledge itself, no less than the scientist himself, is part of the picture the Creator is drawing. The scientist cannot climb out of the picture to separate the agency of the Creator from that of an entity within space-time. Creation is an account of God's activity on a higher order than the account given by the natural scientist. So Hawking's God (discussed above) is not only deist in conception, but also a typical instance of the "god-of-the-gaps".

Perhaps the best-known example of such a deity in the history of science is to be found in the work of the great mathematical and experimental genius, Isaac Newton (1643-1727). Not only did Newton invoke God as the non-mechanical First Cause of his mechanistic world-system, but he argued that the dynamic instability of the planetary orbits (due to fluctuations caused by gravitational attractions between the planets and from passing comets) was counteracted by periodic divine interventions. The Frenchman Pierre de Laplace (1749-1827) later used Newton's own theory to show that Newton had underestimated the stability of the planetary system. He proposed, instead, a mechanistic explanation for the formation of the latter (the famous "nebular hypothesis"). This may have been a vindication of the power of Newton's equations, but it only brought his theology into disrepute. There is an apocryphal but oft-recounted story of the emperor Napoleon, having listened to Laplace's exposition of his theory of the solar system, exclaiming, "And what place has God in all this?"; and receiving the answer, "Sire, I have no need of that hypothesis". Laplace's words were not an assertion of atheism (though they were taken as such in subsequent history) but a rebuttal of the Newtonian god-of-the gaps.

Let us take an example from biology. When the influential writer Richard Dawkins, for instance, argues that "Darwinism makes it possible to be intellectually fulfilled as an atheist" and that "Natural selection is the blind watchmaker, blind because it does not see ahead, does not plan consequences, has no purpose in view. Yet the living results of natural selection overwhelmingly impress us... with the illusion of design and planning"[14], he is indulging in god-of-the-gaps-style thinking. He assumes that if we can explain the causal mechanisms behind living organisms, then talk of "design and planning" (that is, teleology or *final causes*) is unnecessary, and so God-talk becomes superfluous.

Observe how Dawkins smuggles into biology emotive terms like "blind" or "selfish" or "purposeless" to reinforce his own atheist outlook, which itself has been formed on other, extra-scientific grounds. (And, paradoxically, he invests an impersonal mechanistic process with personality, turning it into a pseudo-god). But natural selection by itself tells us nothing either in favour of "purpose" or against it. Selves/Subjects can see or have minds or formulate

purposes but mechanisms cannot. However, the fact that any mechanism per se is by definition "blind" or "mindless" does not exclude the possibility that it has a meaning and purpose given to it by its incorporation by a self/subject into a larger scheme of things. The fact that the operation of pistons, spark plugs and carburettors in a car engine are "blind" does not imply that the car can be used to reach a destination that the car-driver has planned. Dawkins' "God" is a god-of-the-gaps, and we can agree wholeheartedly with his "atheism".[15] (In the next section and in Chapter 6, I shall argue that nature *as a whole* does embody purpose in its progressive movement from non-being to being, and from life to sentience and human intelligence).

Furthermore, there is a remarkable irony in Dawkins' blind watchmaker thesis. Writing of some of Darwin's twentieth-century followers who have eliminated God from their world-view while still clinging to the rationality of science, the historian and philosopher of science, Stanley Jaki, makes the trenchant observation: "Their work is a life-long commitment to the purpose of proving there is no purpose. Every Darwinist is a living refutation of a philosophy, Darwinism, for which purpose is non-existent."[16] Dawkins' own work as a scientist seems to be undermined by his thesis. We are purpose-driven, truth-seeking, meaning-oriented beings; and, if the evolutionary story were taken as the *ultimate* story about ourselves, these subjective experiences are inexplicable. Within his scientific naturalist perspective, the only "purpose" to life is to reproduce as much of one's DNA as possible. What would happen to all intellectual and cultural achievement in a society that truly embraces this as its dominant world-view?

2.5 Evolutionary Red Herrings

Dawkins stands in a growing tradition of biologists who have ventured beyond their field of expertise into grand theorizing about human life. This would be unobjectionable if not for the fact that they tend to impress their readers more by the force of their professional reputation than by convincing arguments. Consider, for instance, the oft-repeated assertion by another famous biologist, stated with all the dogmatic certainty of religious conviction: "Chance alone is at the source of all innovation, of all creation in the biosphere. Pure chance, absolutely free but blind, is at the root of the stupendous edifice of evolution.... The biosphere looks like the product of a unique event whose chances of occurring were almost nil... The universe was not pregnant with life.... Our number came up in the Monte Carlo game."[17]This comment carries the authority of a Nobel prize-winner, Jacques Monod, himself the grandson of the greatest evangelical preacher of nineteenth-century France, Adolphe Monod.

Monod's invocation of Chance (with a capital C) is fraught with logical errors. The scientific notion of chance is an indication of our ignorance: "chance" or "random" events are unpredictable, either because the predictive schemes are too complex (as, for instance, when we try to forecast weather patterns) or (as in the subatomic domain of what is known as quantum physics) because no prior set of events existed from which they followed according to law-like precedent. Most physical laws are of a statistical kind: they speak in terms of probabilities of finding an entity or system in a given state at a given time. But "chance" is not an agent that does things. It is not the source or cause of anything. Rather it stands for the absence of any assignable causal precursor.

The other notion of chance, with which Monod confuses scientific chance, is the ancient mythological concept of Chance (with a capital C), a capricious deity, the personification of chaos and meaninglessness. It is this latter pseudo-deity which biblical theism rejects. If we follow the concept of creation outlined earlier, then all physical events, with or without causal precursors in space-time, depend for their occurrence on the sovereign will of the Creator.

Whether scientists classify events and processes as physically "determinate" or "indeterminate" (i.e. chance) is of no concern to the biblical writers. They assure us that God is the giver of being to both categories of events (*e.g. Prov. 16:33*). Thus chance, when used in a strictly scientific manner, is not an alternative to a theistic interpretation of physical events. (Interestingly, the recent study of chaotic systems in different branches of science have revealed an ordered structure even in processes classed as "chaos"; but these arguments are irrelevant to the semantic clarification above).

The title of Dawkins' most famous book is intended as a refutation of the Divine Watchmaker model of William Paley and other eighteenth-century English writers ("God" winds up the universe like a clock and then leaves it to run its course). This kind of God served to give a sense of design to the world, but he himself was unfree, unlovable, unknowable, uninvolved and unconcerned! This was the God behind the eighteenth-century Enlightenment idea of "natural religion", the God of Voltaire and Rousseau, the Underwriter of universal reason in Descartes' project of liberation from culture, and the Guarantor of universal human rights in the American constitution. It is not surprising that Darwin's theory of natural selection, first published in 1859, dealt a crippling blow to such "natural religion" as well as to the god-of-the-gaps approach of more traditional theists. But Christians who were more biblical in their thinking were grateful for the fresh impetus it gave to re-examine their understanding of how God interacts with his world.

To what extent was the Darwinian theory a challenge to Christian faith in the latter years of the nineteenth century? It is difficult to answer this question, because the introduction of any radically new theory provokes strong and immensely diverse reactions. Recent historical studies have shown up the wide range of responses, both among the scientific community as well as the Church.[18] Some scientists opposed the theory on purely scientific grounds, other scientists on religious grounds. There were others, Christian and atheist, who incorporated the theory into their world-view with little fuss. The historian Owen Chadwick points out, in his survey of nineteenth century secularization, that the "onslaught upon Christianity owed its force... not at all to the science of the nineteenth century. It attacked Christian churches not in the name of knowledge but in the name of justice and freedom."[19] Chadwick found only three British scientists who confessed to being led away from a prior religious faith partly by their scientific learning, one of whom was Charles Darwin. The intellectual "crisis of faith" on the part of prominent Victorians had little to do with science, let alone evolution.

In his impressive survey of Christian responses to Darwin in late nineteenth-century Britain and the USA, James Moore has shown how the more evangelical (or biblical) a person's theological outlook, the more likely that person was to accept the theory and incorporate it into his world-view.[20] This was because the more orthodox a person's theology (for example, Trinitarian as opposed to Unitarian) the further removed he was from the deistic outlook. Those who held to the sovereignty of God and his continuing interaction with his creation were less likely to be shocked by any thesis of "common ancestry" between humankind and other creatures. The most bitter denunciations of Darwin in Britain were found among the High Anglicans, into whose theology deism and god-of-the-gaps type design arguments had made deep inroads. Moreover, a high view of biblical authority led to a refusal to use the Bible as a set of proof-texts from which to discover biological and geological data. Evangelicals stood in the Reformation tradition which taught respect for the "book of nature" alongside the "book of Scripture": one knew God in a saving way through the latter, and could then discern his ways by exploring the former. If the same God stood behind both nature and scripture, there could be no final conflict between the deliverances of both. A cautious "wait and see" attitude, which

held that both current scientific theories and traditional interpretations are always open to correction, also seemed most honouring to God.

Among the Protestant scholars who did not see evolution as a threat to biblical faith were such prominent figures as B.B. Warfield, G.F. Wright, A.A. Hodge and James Orr. Indeed, Warfield, who was one of the greatest defenders of biblical authority against the liberal or modernist wing of the American Church, described himself as a "Darwinian of the purest water", stating that "for myself... I do not find that there is any general statement in the Bible or any part in the account of creation... that need be opposed to evolution."[21] It was largely through the efforts of three evangelicals (Asa Gray, G.F. Wright and James Dana) that Darwin's theory was popularized in the US. It is ironic that several of the founders of "fundamentalism" (which, in its original sense, sought to defend the fundamental doctrines of the Christian faith) were least troubled by the scientific aspects of the theory. Why is it, then, that many Christians today, and especially those influenced by the North American fundamentalist stream, tend to stigmatize evolution and evolutionary thinking as the greatest satanic deception that the Church has to counter?

There are various reasons, sociological as well as theological, impossible to explore here.[22] But a first step in sorting out the confusion must lie in a clarification of concepts that people use.

What do we mean by *evolution*? The term can refer to: (a) the general idea of modification with time, so the earth with its life-forms that we experience today are not the same as, say, ten million years ago; (b) the belief that all organisms are related through a common ancestry; (c) a theory setting out a specific explanatory mechanism for (b) above, as in the neo-Darwinian synthesis of natural selection with modern genetics; (d) a philosophical position that argues (from one or a combination of the above) that a theistic interpretation of life is outdated and contradicted by the "facts" of science; and (e) an extension of one or more of the above to explain the origins of human morality, culture and religious behaviour, usually with the assumption that what comes later is an improvement on what preceded it.

Of the above meanings of the term, (a) is indisputable. Both (b) and (c) are acceptable if there is empirical support for them and also no alternative theory to account for biological variation and change. As we have seen, science proceeds by building coherent patterns of explanation, so that a theory that can account for some observations is far better than no theory at all. In the words of a famous philosopher of science, Imre Lakatos, "A theory can only be eliminated by a better theory, that is, by one that has excess empirical content over its predecessors, some of which is subsequently confirmed."[23] Biologists like Dawkins have indeed shown the rich explanatory power of neo-Darwinian theory.

Darwin's formulation of the mechanisms of evolutionary change, combined with twentieth-century discoveries in genetics and molecular biology, accounts for both the astonishing diversity and interconnectedness of all living beings on the earth. However, when it comes to interpreting the details of evolution, there is much less agreement and often acrimonious debate. An ultra-Darwinist orthodoxy identifies evolutionary change almost exclusively with random genetic mutations and contingency. Biological forms and behaviour are what they are purely by happenstance. Any notion of *telos* or progress in the unfolding story is mere illusion. In recent years, several biologists, as well as physicists and mathematicians, have challenged this received wisdom. They have pointed out that holistic, directional principles of biological organization (hitherto little understood) must also be at work. Simon Conway Morris, for example, who is Professor of Evolutionary Paleobiology at Cambridge University, draws our

attention to the well-known phenomenon of evolutionary *convergence*: namely, the recurring tendency for biological organization to "navigate" towards the same solutions for particular "needs". "Not all is possible," observes Morris, "options are limited, and different starting points converge repeatedly on the same destinations...The 'landscape' of biological form, be it at the level of proteins, organisms, or social systems, may in principle be almost infinitely rich, but in reality the number of "roads" through it may be much, much more restricted."[24]

Moreover, theories of the origin of life itself (about which Darwin himself was silent) are trapped in an irresolvable dilemma: even the simplest building-blocks of life seem to require highly complex enzymes and DNA molecules for their synthesis, yet the latter are presumably- on the evolutionary picture- themselves constructed from these simpler units. Whether this "chicken or the egg" situation can be resolved by invoking neo-Darwinian mechanisms alone is extremely doubtful; it is far more likely that the new multi-disciplinary approach which is emerging, based on more "holistic" organizational mechanisms and physical constraints, will be needed to complement the neo-Darwinian scenario.

It is positions (d) and (e) above which constitute the real threat to Christian (or any theistic) faith. But we have seen how empty and fallacious these arguments can be (Dawkins is an example of (d), while Freud was an example of (e)). These philosophical views, which essentially use biological ideas to promote a political agenda, have usually been labelled "evolutionism" or "evolutionary naturalism". They make of nature and evolution new deities, often spelling them with a capital N and a capital E and ascribing to them personal agency. This again is ironic testimony to the inability on the part of humans like ourselves to practically (as opposed to theoretically!) embrace life in an impersonal universe.

The anti-Darwinist American movement known as Intelligent Design represents a significant cultural reaction to the corruption of evolution by militant secularists. Proponents of ID see it not as a religious doctrine but as a scientific investigation into how the patterns exhibited by certain arrangements of matter signify an active intelligence behind their formation. For example, the biochemist Michael Behe, one of the founders of the ID movement, asserts that phenomena such as blood-clotting in vertebrates is a process too complex to explain by Darwinian evolution. He calls this process "irreducibly complex" and claims that it displays evidence of "design". Clearly the word "design" is being used at a higher level than merely biological functionality. We have no problem in saying that all living things are designed for survival and reproduction. But the ID movement uses "design" language in a stronger sense in the context of biology. For example, Behe writes that: "The laws of nature can organize matter... The most relevant laws are those of biological reproduction, mutation, and natural selection. If a biological structure can be explained in terms of those natural laws, then we cannot conclude that it was designed."[25] This seems to be a very clear statement of a dualistic universe: there is one class of phenomena that obeys "natural laws" and came into being "naturalistically"; while there is another class of phenomena that has been specifically "designed", presumably by a Designer.

We find a similar approach in William Dembski's book *The Design Revolution*. Dembski argues as follows: "[T]here has to be a reliable way to distinguish between events or objects that result from purely natural causes and events or objects whose emergence additionally requires the help of a designing intelligence... at issue is whether natural causes are supplemented or unsupplemented by design. The whole point of the design inference is to draw such a distinction between natural and intelligent causes."[26] So both Behe and Dembski

envisage a split biological world: some processes and objects are due to "natural forces", and follow "natural laws" of development, while others are specifically "designed".

Now this is poor theology. It actually undermines the traditional Christian doctrine of creation which, as we saw, speaks of God's active, purposive involvement in *every* aspect of the universe. We have seen that what a scientist may call "natural processes" or "natural laws" are the expression of God's normal way of working, which is via secondary causes. There is no "natural world" and "designed world", but one world, *a creation,* which has to be understood *at different levels of meaning*. Trying to bring final causes into scientific explanations, and so reduce a theology or philosophy of nature to a scientific theory, is (paradoxically) to elevate science into the only valid mode of knowledge. We shall return to this theme in Chapter 6.

But ID is also poor science. Simply saying that a biological entity is "designed" leads to no experimental programme that could be utilised to test the hypothesis. What the ID proponents have been trying to do is to simply re-define as "irreducibly complex" those systems for which we do not currently understand the biochemical pathway. But we now know a lot more about the evolution of some of the systems that Behe was highlighting as supposedly "irreducibly complex" in the mid-1990s. Some of these insights have come about through the complete sequencing of multiple genomes from about 200 different animals, plants and bacteria, plus partial data from the sequences of thousands more genomes. By comparing these different genome sequences it is now possible to go back in evolutionary time to see where a particular gene crops up for the first time. We now know that the process of gene duplication, whereby a gene ends up being copied twice on a single chromosome, leaving the second copy to drift by a process of mutation and acquire new functions, is an important mechanism in evolution. Most probably, this is the way that the enzymes involved in blood clotting have evolved. So in just a decade our understanding of the evolution of the blood-clotting system has increased greatly.[27]

Moreover, all the biological sub-systems that maintain cell growth and division, including all biochemical pathways, are complex without exception. It could easily be argued that all of them fall within the ID criteria used to identify an irreducibly complex system, since in each and every case the sub-system only functions properly providing all the components are in place, although there is also some degree of redundancy. And the fact that at present we do not know, by any means, all the incremental evolutionary steps involved in *every* biological system, should be a motivation for hard work in the lab. There is a lot of science still left to be done.

One of the most sensitive Christian thinkers during the formative years of the modern world was the great scientist-theologian Blaise Pascal (1623-1662). Deeply sceptical of attempts to ground belief in God in either first principles of human reasoning or in arguments from design, Pascal pointed to the ambivalence of human existence: we are corrupt and wretched, subject to selfishness, guilt, boredom and anxiety, yet showing the vestiges of our created grandeur through our awareness of this condition. Humankind is suspended between the finite and the infinite, conscious of an inner void which nothing in nature can satisfy. No philosophy can make sense of this, no moral system can make us better and happier. Only the One who combined human greatness with human degradation on the cross can transform our condition and bring us to the knowledge of ultimate Truth. "All of those who seek God apart from Christ, and who go no further than nature, either find no light to satisfy them or come to devise a means of knowing God without a mediator, thus falling into either atheism or deism, two things almost equally abhorrent to Christianity."[28]

2.6 Celebration

At the entrance to the Cavendish laboratory in Cambridge, England, where many of the pioneering breakthroughs in nuclear physics were made, are inscribed the words of Psalm 111:2 : "Great are the works of the Lord, studied by all who take pleasure in them". The Christian's attitude to the works of God is to be marked by study and delight. Hard work, but pleasurable work. "You never enjoy the world aright," wrote the young English poet Thomas Traherne (1637-1674), "till the sea itself floweth in your veins, till you are clothed with the heavens, and crowned with the stars: and perceive yourself to be the sole heir of the whole world: and more than so, because men are in it who are every one sole heirs, as well as you. Till you can sing and rejoice and delight in GOD as misers do in gold, and kings in sceptres, you will never enjoy the world."[29]

The knowledge of this God is not deduced from the study of the physical world. Rather, it is the knowledge of God which is given in the biblical revelation that provides the imaginative framework in which the physical world itself is recognized as a creation, affirmed in its goodness and beauty, explored and celebrated. It also keeps us from either lapsing into the worship of the world itself or denigrating and exploiting it for our selfish ends. Our exploration is only a *response* to the initiative taken by God in making himself known to us as our Redeemer and Lord. It is a rational response, prompted by the rationality of the divine self-disclosure. In the fine words of the Scottish theologian Thomas Torrance, "If we are to engage in scientific exploration of the universe in response to the Word of God incarnate in Jesus Christ by whom it was made, we must learn to respect the nature of all created things, using pure science to bring their mute rationalities into such articulation that the praises of the Creator may resound throughout the whole universe."[30]

The picture of the universe as a creation, permeated and guided by the Word of God, not only undergirds scientific activity but all language, music and the arts. No one today has expressed this insight with greater eloquence than the literary scholar George Steiner. Why should there be art, why poetic creation? The question is an exact analogue to that posed by Leibniz (1646-1716): why should there be being and substance, why should there not be nothing? Here is Steiner's answer (while acknowledging that every true poem, piece of music or painting says it better): "There is aesthetic creation because there is *creation*. There is formal construction because we have been made form... The core of our human identity is nothing more or less than the fitful apprehension of the radically inexpressible presence, facticity and perceptible substantiality of the created. It is; we are. This is the rudimentary grammar of the unfathomable."[31]

Steiner sees the aesthetic act, the conceiving and bringing into being of that which has no being, to be an *imitatio*, a replication on its own scale, of the inaccessible *fiat* of divine creation. He concludes, "It is a theology, explicit or suppressed, masked or avowed, substantive or imaged, which underwrites the presumption of creativity, of signification in our encounters with text, with music, with art. The meaning of meaning is a transcendent postulate."[32]

Notes

[1] Stephen Hawking, *A Brief History of Time* (London: Bantam Press, 1988) p.184

[2] See further K.A. Kitchen, *The Bible in its World* (Exeter: Paternoster, 1977) pp.60ff; H. Blocher, *In the*

Beginning (Leicester: Inter-Varsity Press,1984) Ch. 2 ; D.J. Wiseman, "Creation Time- What does Genesis say?" in *Science & Christian Belief*, vol. 3, no.2, April 1991; John H. Walton, *The Lost World of Genesis One* (Downers Grove, Ill: IVP Academic, 2009)

[3] See John Walton, Ibid.

[4] Helga Kuhse and Peter Singer, *Should the Baby Live?: The Problem of Handicapped Infants* (Oxford: Oxford University Press, 1985) p.138

[5] See Oliver O'Donovan, *Begotten or Made?* (Oxford: Oxford University Press, 1984)

[6] Quoted in C. Everett Koop, *The Right to Live, the Right to Die* (USA: Tyndale House & UK: Coverdale, 1976)

[7] Arnold Toynbee, *Horizon*, vol. xv, 1973, pp.6-9

[8] Joseph Needham, *Science and Civilization in China*, 4 vols. (Cambridge University Press, 1954-62)

[9] Rene Dubos, *A God Within* (London: Sphere Books, 1976) p.114

[10] Ibid.p.115

[11] See Richard L. Fern, *Nature, God and Humanity: Envisioning an Ethics of Nature* (Cambridge, UK: Cambridge University Press, 2002) Ch.2

[12] Richard Bauckham, "Jesus and the Wild Animals (Mk 1:13): a Christological Image For an Ecological Age", in J. Green and M. Turner (eds.) *Jesus of Nazareth: Lord and Christ* (Grand Rapids: Eerdmans/ Carlisle: Paternoster, 1994)

[13] Hawking, op.cit. p.149

[14] Richard Dawkins, *The Blind Watchmaker* (London: W.W. Norton, 1986) p.21

[15] For a fuller critique, see Alister McGrath, *Dawkins' God: Genes, Memes and the Meaning of Life* (Oxford: Blackwell, 2005)

[16] Stanley L. Jaki, *Angels, Apes and Man* (Illinois: Sherwood Sugden & Co, 1983) p.63

[17] Jacques Monod, *Chance and Necessity* (London: Collins, 1971)

[18] See, e.g., J. R. Moore, *The Post-Darwinian Controversies: a Study of the Protestant Struggle to Come to Terms With Darwin in Great Britain and America,1870-1900* (Cambridge University Press, 1979); D. N. Livingstone, *Darwin's Forgotten Defenders: the Encounter Between Evangelical Theology and Evolutionary Thought* (Grand Rapids: Eerdmans & Edinburgh: Scottish Academic Press, 1987)

[19] Owen Chadwick, *The Secularization of the European Mind in the Nineteenth Century* (Cambridge University Press, 1975)

[20] Moore, op.cit.

[21] Quoted in Livingstone,op.cit.p.118

[22] For an excellent summary, see Denis Alexander, *Rebuilding the Matrix: Science and Faith in the 21st Century* (Oxford: Lion, 2001) esp. Chs. 7 & 9

[23] Imre Lakatos, *The Methodology of Scientific Research Programmes: Philosophical Papers*, Volume I (ed. John Worrall and Gregory Curries, Cambridge University Press, 1978) p.150

[24] Simon Conway Morris, *Life's Solution: Inevitable Humans in a Lonely Universe* (Cambridge: Cambridge University Press, 2003) p.11

[25] Michael Behe, *Darwin's Black Box: the Biochemical Challenge to Evolution* (New York: The Free Press, 1996, Second Edn. 2006) p.203

[26] William Dembski, *The Design Revolution* (Downers Grove, Ill: Inter-Varsity Press, 2004) p.75

[27] Denis Alexander, Personal Communication. For more critiques of the ID movement, see the resources available at www.faraday.org

[28] Blaise Pascal, *Pensees*, tr.by A.J. Krailsheimer (Harmondsworth: Penguin, 1966) no.449

[29] Thomas Traherne, *Poems, Centuries and Three Thanksgivings*, ed. A. Ridler (Oxford: Oxford University Press, 1966) p.177

[30] T.F. Torrance, *God and Rationality* (Oxford: Oxford University Press, 1971) p.164

[31] George Steiner, *Real Presences* (London: Faber and Faber, 1989) p.201

[32] Ibid.p.216