God and Creation

- scripture and science: two stories that explore one reality

The Challenge

‘ Science has discredited any idea of a divine Creator
and the biblical account of origins.‘

Beginning a response

‘It seems that those evocative words, “In the beginning …”
have not lost their power to set human minds stretching out
to the fringes of things – and probably they never will.’[1]

The subject of our primeval origins, cosmic and human, touches something deep within the psyche of every person and every society. This should come as no surprise because origins unlock identity and principles. The way things are constructed reveal their nature. The conclusions we reach about our origins will fundamentally influence our sense of selfhood, purpose and meaning.

We have already examined the challenge of science to faith[2] and have seen that there is no essential incompatibility between the two; problems occur only when scientific hypothesis is turned into a philosophy. Discussion about ‘God and Creation’ is the central case study in the whole debate about science, faith and the biblical text. Everything in our reply to the challenge that science has discredited the idea of a divine Creator and the biblical account of creation will be built upon the principles and conclusions we have already drawn. Throughout our response we will have the opportunity to illustrate these principles in clear and specific ways.

Sadly the debate is not simply between Christian and sceptic, but in many cases there are heated disputes between believers. The biblical accounts of creation are challenged by:

- Other ancient origin myths and stories;
- Other accounts of creation by science;
- Other interpretations of the biblical text.

Agnostics put their trust in the empirical nature of science and see biblical statements as naive; like Pierre Laplace replying to Napoleon they say, ‘God? – I have no need of this hypothesis.’ Christians often have a deep distrust of science and a very defensive attitude about the biblical text; they often reply, ‘The Bible says it, I believe it, that settles it!’

Important questions are raised about how we think about the cosmos, science and Scripture. The great conflicts of the 19th century focused primarily on the question of God and creation; these issues are as alive today as ever, but as we shall see cosmology and the new physics has thrown the debate wide open with exciting fresh challenges.

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[1] Angus Macpherson, ***Daily Mail***, 26 April 1992

[2] See ‘Science and Faith’ above

Facing the challenge of creation is a very humbling experience, with many questions remaining unanswered. It needs to be treated sensitively; the issues run deep and people feel very emotional about them. Christians and agnostics have much to learn from each other if only they are prepared to.

'What?' and 'When?'

'Whence arises all that order
and beauty we see in the world?'

Isaac Newton

The existence of the universe is a fact. Every person not only experiences its reality but is part of its very fabric. In our discussions on science and faith[3] we have already seen how the primary questions are 'How?' (mechanism and science) and 'Why?' (meaning and faith). The challenge of these two dimensions of truth form the foundations to our whole debate about creation. However, we will build upon them more specifically with the questions 'What?' and 'When?':

- What actually happened to bring the whole cosmos, in all its intricate form, into being?
- When exactly did the act or acts of creation actually take place?

Endeavouring to answer these questions will drive us to study the 'book of nature' and the 'book of Scripture' with the greatest care:

- Are they saying the same thing?
- How are differences to be resolved?

Genesis and science

The first chapter of Genesis is clearly the most comprehensive biblical statement about creation. It is therefore essential, at the beginning of any discussion on the subject, to decide what the relationship between the biblical text and scientific observations should be. There are three main ways in which the relationship is viewed; concordism, creationism and fideism:

- **Concordism:** This attempts to point to the harmony between Scripture and the discoveries of science. The Genesis account is seen as the best summary of what is known about the origins of the cosmos. The biblical interpretation tries to bring out points of agreement between the text and scientific theories. It finds in the text a sort of outline for modern cosmological theory:

  - ***Strength:*** its search for coherence between science and Scripture. As we have said, science is dealing with God's 'book of nature', revelation in creation, and all truth is God's truth;
  - ***Criticism:*** it often asks too much of the text; in trying to read it in the light of modern science it often distorts it and also obscures the true meaning. As scientific

[3] See 'Science and Faith' above

understanding advances, theories change and the biblical interpretation becomes discredited.

- **Creationism:** This is also called 'anti-scientism', because it insists on a heavy literalistic interpretation of Genesis (the word 'anti' should be understood in both senses of the Greek – 'against' and 'in the place of'). Creationism is a protest against the way in which science is becoming a religion to many people. Creationists build a substitute science; a scientific explanation of phenomena to replace current theories. They believe biblical revelation is incompatible with present-day scientific opinions. They reject support for prevailing scientific theories:

  - ***Strength:*** its reminder of our need to be constantly and critically vigilant about the illusion of the pure objectivity, neutrality and autonomy of science. As we have seen, scientific theories have presuppositions under girding them, many of which are anti-God.
  - ***Criticism:*** its alternative theories underestimate the value of scientific consensus reached throughout the world. Other scientists constantly subject scientific theories to rigorous and critical analysis. Scientific agreement is not reached by either chance or conspiracy. They minimise the value of identical conclusions reached independently by divergent scientific methods. Creationists also give a 'literal' meaning to the text of Genesis, which other readers do not find there; this is an issue we shall discuss at greater length below.

- **Fideism:** This is the belief that knowledge depends upon faith rather than reason; it attempts to resolve the problem by suppressing it. The dimension of scientific investigation and the dimension of faith are seen as entirely separate. The opening chapters of Genesis are said to deal with faith and not cosmology; they teach spiritual truth not scientific truth, they are doctrinal not historical. It rejects the conviction that revealed truth touches the area of science:

  - ***Strength:*** its reminder that we should distinguish between faith and scientific research. Reality is made up of many aspects. The primary purpose of biblical revelation is to speak of our relationship with God, who while Creator is also distinct from creation and so cosmology and revelation will not always coincide. The Genesis text will become distorted if it is used to answer scientific challenges of our time.
  - ***Criticism:*** while the Bible is not a handbook of science, it has much to say that touches the realm of the scientist. You cannot make a sharp distinction between physics and metaphysics; faith touches every realm for all things are created and sustained by God. Biblical doctrine cannot be separated from history.

When we read the creation account in Genesis it is inevitable that current scientific theories will have some influence on our interpretation. However, the biblical text must free to speak for itself and never placed under another authority. The final authority is God speaking personally:

- We must recognise the human fallibility in both scientific theory and Bible interpretation;
- We must allow science to play a 'servant-role'; observation of reality must aid understanding;

- We must not let our 'prior knowledge' act as a 'silencer' on the text speaking;[4]
- We must make our first concern the true understanding of the biblical text;
- We must harmonise our interpretation of Genesis with credible scientific findings;
- We must be cautious about approving or condemning particular views of scientists.

Our initial interpretation of Genesis must depend solely upon the text and its context. The human author of the narrative was ignorant of modern scientific thought; so we must not make scientific views part of the actual interpretation.[5] Only after this do we reflect on our interpretation in the light of modern scientific observations. These will have an external effect, for the work of interpretation is never complete. 'The sciences stimulate the interpreter from without, driving them to verify their exegesis and test the evidence, or encouraging them by favourable convergences … but they have neither authority, nor even a substantial ministerial role within the actual interpretation; they act as warnings and confirmations at a later stage.'[6]

Creation and Story

In the first three chapters of Genesis we have two creation narratives:

- 1st narrative Gen 1:1–2:3(4) a framework of seven days;
- 2nd narrative Gen 2:4–3:24 a framework of seven paragraphs.[7]

Why is the biblical revelation about universal origins presented in two narratives? They are:

- Two contrasting traditions that sharpen the whole truth;
- Two complementary traditions that complete each other.

It has been insightfully stated that 'the two creation stories are in many respects open to each other' and exegesis on the two must be carried out together.[8] The differences between the two concern perspective and exposition:

- **Narrative1:** a panoramic prologue; setting the creation of cosmos in perspective;
- **Narrative2:** an ancestral story; setting the creation of humanity in perspective.[9]

Genesis 2:4 is the critical transitional connecting point:

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[4] e.g. We know that creation took millions of years, therefore the 'days' must be allegorical.

[5] 'We have the right to bring our prior knowledge of reality to bear only as far as we can presuppose it in the human author of the text.' See Henri Blocher, ***In the Beginning***, IVP, 1984, p. 26.

[6] Blocher**,** ***In the Beginning***, p. 27.

[7] J T Walsh quoted in Blocher, ***In the Beginning***, pp. 27-30: – A 2:4-17 A^{a} 3:20-24
B 2:18-25 B^{a} 3:14-19
C 3:1-5 C^{a} 3:9-13
D 3:6-8

[8] G von Rad, ***Genesis*****,** SCM, 1961, p. 41

[9] Prefaced by 'generations' (Heb *tol^{e}dot*) as in 10 other places in Genesis – cf. 6:9; 10:1; 11:10, 27; 25:12, 19; 36:1, 9; 37:2.

‘These are the generations of the heavens and the earth
when they were created,
in the day that the Lord God made the earth and heavens.’

Notice how the initial statement, ‘the heavens and the earth’ changes to ‘the earth and the heavens’, the whole focus and perspective changes.

Both stories are lofty, dignified statements devoid of the crude character of other ancient creation stories. Both stories speak about the origins of the visible world from the perspective of an eyewitness account; they deal with simple observable phenomena.[10] Each story comes from a different literary source but their truths harmonise and complement each other wonderfully.

- **Narrative 1:** This is a masterpiece of sweeping thought. The simple, spare style presents awesome truth with restrained power against a cosmic landscape; yet without losing the human perspective. It has a prose structure with a poetic texture. It lacks the rhythm of actual poetry or synonymous parallelism, yet there is rhythm, repetition and alliteration in the sentences – it is surely a strophic hymn in prose, with the recurring declaration, ‘it is good’, it is a cry of praise.

- **Narrative 2:** This is a jewel of divinely earthed communication. The focus is narrowed, but the story is lively, picturesque and personal. The Creator takes on human style; moulding clay, breathing into nostrils, walking in the garden, making clothes. The environment is a dream-garden, strange trees, woman from a rib, talking animals. While mythic in style it is mature artistry; it lacks naiveté and has a disciplined structure (7 paras?). It shows the author as an expert psychologist. Many plays on words reveal a clear technique.[11]. The theological richness distinguishes it from myth; it has a style of the wisdom writers in using common language to convey unique ideas.

What form did the revelation take? There are conflicting theories:

- A pagan myth taken and purified with monotheism: there are parallels, but the resemblances are incomplete and the contrasts most striking;
- A revelation transmitted by oral tradition tracing right back to Adam: the text suggests nothing that points in this direction;
- A ‘retrospective apocalypse’:[12] parallels with the inspiration of the wisdom writers; knowledge in a concentrated form, or mature meditation on the finished works of God. This seems the most likely source.

Days and aeons

The most striking feature of the first Genesis creation narrative is its distinctive structure of seven days; each carefully numbered and clearly intentional. This clear format lies at the heart of the difficulties in interpreting the text, the strong disagreements between Christians and the sceptical dismissal of the account by agnostics. Many different attempts

[10] cf. J A Thompson, ‘Creation’, ***New Bible Dictionary***, IVP, 1982, p.245.
[11] See Blocher, *In the Beginning*, pp. 35-36.
[12] Claude Tresmontant quoted in Blocher, ***In the Beginning*****,** p. 34.

have been made to resolve the paradox of the week; here are some of the most widely held approaches:

- **The literal theory:** This theory has been the most popular one throughout church history, from the Reformers to J C Whitcomb and the Creation Research Society:

  - ***Argument:*** Creationists believe that the six days of creation are to be taken in the ordinary sense of 24-hour days. The whole passage is viewed as a chronological account of creation, the history of the early cosmos being revealed by God. They argue that there is no hint of figurative language in the passage, and that references elsewhere in Scripture – such as Exod 20:11; Matt 19:4; 2 Pet 3:5 – show that other biblical writers treated the story literally. They believe that if in fact the Genesis account is not literal then Scripture is emptied of its power.[13] Creationists also believe in a 'young earth' in which the geological phenomena can be explained by a catastrophic flood, as in Gen 7–8.
  - ***Objection:*** The important question is, 'Does the text categorically demands a literal interpretation?' We shall see below that this is open to real dispute. It is also questionable whether either Matt 19:4 or 2 Pet 3:5 understand Genesis 1 literally; neither of them refers to the seven days. Exodus 20:11 simply points back to the creation story, it does not demand literalism. The similar passage in Deuteronomy 5:12-15 refers to the Exodus, not the creation; this suggests the seven-day structure is a literary device and not a historical account. We must rid ourselves of the idea that figurative language is somehow inferior to literal language; nothing in the Bible supports such a view.[14] A literal interpretation always falls back on divine miracle and omnipotence when it confronts difficulties; while the sovereignty of God is central to creation, is an appeal to the miraculous the true solution to every textual difficulty? There is no questioning the courage of the creationists in rejecting scientific theories; the major question is whether they are in fact correct.

- **The reconstruction theory:** This theory was first propounded by Thomas Chalmers (1780–1847), and was popularised by C I Scofield in his annotated Bible:

  - ***Argument:*** Reconstructionists attempt to reconcile Genesis 1 with discoveries about the age of the earth. The six days are not days of creation but days of reconstruction by God following a terrible primeval disaster. This is believed to have occurred in the perceived mysterious gap between the first and second verses of Genesis 1; hence its common title: 'the gap theory'. They argue that the text should be translated, 'the earth became without form and void'; since the expression tohu wabohu is used in other places to express the effects of destruction (Isa 34:11; 45:18; cf. Jer 4:23) so one must suppose a catastrophe occurred. Also the presence of darkness, the symbol of evil, is believed to show that evil had come into the world; with animal death before human death. All this must refer to a satanic revolt (cf. Isa 14:3-23; Ezek 28:11-19), how else is evil explained?
  - ***Objection:*** The important question is, 'Is this a natural or possible way of reading the biblical text?' The reference to primeval chaos, 'without form and void', certainly does not mean there had to have been a catastrophe. The darkness is not necessarily evil;

[13] e.g. the light before the sun must have been divine light

[14] So many examples cf. parables Matt 13; Ezek 16 with 22, visions in Daniel and Revelation, etc.

in this context it is simply readiness for the light. Added to these objections the theory is simply quite impossible; the translation, 'And the earth became …' does violence to the Hebrew; it can only mean, 'Now the earth was …' (cf. Gen 3:1; Jonah 3:3).

- **The vision theory:** This theory was first propounded by a Jesuit priest, Homelier, but widely popularised by P J Wiseman in his book Creation Revealed in Six Days:[15]

  - ***Argument:*** Visionists believe that the six days of creation refer to a period of time in which God revealed the story of creation to the author. This of course frees creation from the restriction of six 24-hour days, yet it preserves the reality of each day, while still allowing for the aeons of time demanded by science. It also reinforces the sense of 'eye-witness report' that the creation story has.
  - ***Objection:*** The important question again is, 'Is this a possible way of reading the biblical text?' The answer is a quite clearly negative; the word 'made' simply cannot be given the meaning, 'made known'.[16]

- **The concordist theory:** This theory was first propounded by Hugh Miller (1869) and more recently hesitatingly approved of by D Kinder[17] and others:

  - ***Argument:*** Concordists argue that the six 'days' of creation represent interminable periods of time which scientists say are required for creation, and that the subsequent aeons match the eras identified by scientists as the stages of creation. They concentrate on the meaning of the Hebrew word *yom* (day), which elsewhere in Scripture is not always restricted in meaning to 24-hour cycles of time; it can refer to indefinite periods of time (cf. Ps 90:4; Isa 4:2; etc.). The text of Genesis itself seems to indicate this, because the 'seventh' day does not conclude with the formula 'and there was evening and there was morning', suggesting an infinite perspective of time. This approach is a genuine attempt to bring together biblical revelation and reasoned science.
  - ***Objection:*** The important question is, 'Do both the text and the observations of science allow for such an approach?' The natural reading of the text would suggest the more usual understanding of 'day' (*yom*) rather than a metaphorical sense, especially with the recurring formula, 'and the evening and the morning'. Added to this there is not the natural agreement between the biblical text and scientific hypothesis which some suppose. Scientific eras are of unequal duration. There are vital differences in the order of the details: Scripture says trees (Day 3) precede marine organisms (Day 5); birds (Day 5) precede insects (Day 6) – science suggests the opposite. However, the greatest objection is that the creation of the sun (Day 4) takes place after the vegetation and trees; the various solutions about 'cloud cover' parting to 'reveal' violates the spirit and language of the text.

How then should we understand and interpret the 'creative week' in Genesis 1?

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[15] Marshall, Morgan & Scott, 1948

[16] cf. D Kinder, ***Genesis*** , IVP, p. 54; B Ramm, ***The Christian View of Science and Scripture***, Paternoster, 1964, p. 222.

[17] Kinder, ***Genesis***, pp. 56-58.

Literature not literalism

There is an approach to the text that believes it was never the author's intention to reveal either the mystery or the history of the physical dimensions of creation, but rather to proclaim the truth and the implications of God as Creator. This way of interpreting the narrative is referred to variously as the 'literary', the 'historico-artistic' or the 'framework' theory. It is not a modern idea; both Augustine and Aquinas have been credited with viewing the shape of Genesis 1 as a logical and literary device, and many others have followed them in more recent times.[18]

The form of a week is an artistic arrangement. The intention is not to supply chronological origins, but to draw out important themes and provide a theology of the Sabbath (any parallels with cosmology are purely incidental). The structure arises from the author's meditation on God's finished work, drawing out an understanding of how creation relates to God and its significance for humanity.

By taking this approach almost all difficulties are solved:

- 'Days' are real days but understood in a figurative whole;
- The differences between the text and science and between the two narratives are no longer difficulties. However, the fact that it eliminates problems does not in itself mean that it is correct, and we must examine the text to see if it suggests that this is a valid approach.

- **Structure and patterns:** A close examination of the overall design of the narrative and its sub-structures and interwoven patterns strongly suggests a literary framework theory:

  - It is a composite literary type (genre), skilfully composed; the author is wise, organised and fond of manipulating numbers – which suggests an artistic rather than a literal interpretation;
  - Studying the days also presents a careful style; geometric form suggests other concerns than chronological. Two triads of days, which correspond to each other:

Separation	Population
Day 1 – light	Day 2 – sky and waters
Day 3 – land and vegetation	Day 5 – birds and fish
Day 4 – luminaries	Day 6 – animals and people
Day 7 – Sabbath: divine & human	

The days are not solar days, there is no chronology only literary shape; the pattern is the creation of spaces and places (1-3) and the creation of occupants (4-6); so the luminaries are in the right place. There are eight creative acts in six days; Day 3 and Day 6 have two creative acts. Day 4 is very significant:

[18] Convincingly argued by Blocher, ***In the Beginning***, pp. 49-59 and elsewhere.

- There is a correspondence with Day 1 (lights);
- There is an anticipation of Day 7 (reference to festivals / Sabbath);
- It is the central day, the pivot on which the whole structure turns;
- The creative command is the fifth word out of ten;
- Total number of words for Days 1-4 is 207; for Days 5-6 is 206;
- It is the central day for the six days of work:
  - Day 4 concludes with the government of the stars
  - Day 6 concludes with the government of humankind
- Humanity are reminded there is a whole realm beyond their grasp; greatness of humankind enclosed within exact limits.

Another structure is found in the focus of the days:

Day 1 Heavens	Day 4 Heavens
Day 2 Heavens	Day 5 Earth
Day 3 Earth	Day 6 Earth

We have a beautiful and subtle narrative with the intricate structure of a finely crafted poem. It proclaims historical truth but in a way that is neither literal nor scientific. It is a literary device in its own right. It has an orderly classification,[19] with recurring emphases:

- An emphasis on the fact that 'God said' – vv 3, 6, 9, 11, 14, 20, 24, 26
- An emphasis and contrast on the words for creation:

Create (Heb *bara*)
- heaven and earth v 1
- sea monsters and living creatures v 21
- human beings v 27

Made (Heb *asa*)
- firmament v 7
- luminaries v 16
- beasts, cattle, creeping things v 25
- human beings v 26

- An emphasis on reoccurring phrases:

- 'let … be' vv 3, 6, 14-15
- 'let be gathered' v 9
- 'let … bring forth' vv 11, 20, 24

- An emphasis on numbers:

- 10 times – 'God said'; verb 'to make'; formula 'according to its kind'
- 03 times – benedictions; verb 'create'
- 07 times – completion formula 'and it was so … and God saw it was good'
- 07 times – God names or blesses; plus the overall framework of 'seven days'

[19] Like a genealogy or a list of priests

The 6+1 literary pattern is found in other ancient Near Eastern texts (Gilgamesh Epic, Enuma Elish, Ugaritic writing). There are patterns of seven in Revelation, which have nothing to do with chronological time.

- **Sabbath and time**

The artistic genius of presenting the reality of cosmic creation within the framework of a week declares that God is the lord of time. He creates time, creates with time and creates within time. God divides time; that fabric of history, within which he communicates and unfolds his purpose and, by creating days with their evenings and mornings he provides the fundamental rhythm of human life. The flow of time has at its centre and its climax the experience of Sabbath. It is this truth that directs the whole narrative.

The *sabat* of creation and the *sabbat* of the covenant[20] clearly connect, but the seventh day of Genesis has no concluding, 'the evening and the morning'. This deliberate omission declares it was never finished and is still continuing (cf. Heb 4:3-5; John 5:17). So if God's Sabbath is 'coextensive with history'[21] – a truth also emphasised by Jesus – how then are we to interpret Exodus 20:11; 31:17?

> 'For in six days the Lord made the heavens and the earth, the sea and all that is in them, and rested on the seventh day; therefore the Lord blessed the Sabbath day and made it holy.' (Exod 20:11)
>
> 'It is a sign between me and the people of Israel together; for in six days the Lord made heaven and earth, but on the seventh day he ceased from labour and was refreshed. (Exod 31:17)

The Genesis and Mosaic Sabbaths are not the same length, but share an analogy between them. The six days of creation represent a great systematic presentation of God's work that becomes the foundational pattern for human work and activity. In turn, the human experience and understanding of the 'week' has become the framework for telling the creation story and its climax; the Sabbath. The cosmic story moves towards a twin-crested peak – humanity and Sabbath. People are the crown of creation, but the Sabbath with its rest and communion with God crowns its purpose.

What is the message of the climax of the first creation narrative?

- It places human work into context; subduing the earth should not be totally absorbing, without communion with God it will become distorting. Work is a gift and a calling but it is not the essence of personhood;
- It links together the meaning of the Sabbath and the theme of the image of God and shows they are interdependent. The framework of the 'week' shows that people are to imitate God upon the earth in work, but only in dependence upon him (Sabbath);
- It emphasises that the divine image-bearer has privileged free activity in a creation completed and a world stable and predictable.

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[20] cf. Exod 20:11 which links with Creation account, yet Sabbath is never spoken of as a primeval law.
[21] Blocher, ***In the Beginning***, p 57.

Time is something profoundly positive. Redemption functions within time not as a deliverance from time. God creates within time and not in a single instant; deeply involved when creating, entering into the divine work and yet not absorbed into what is created. God remains sovereignly free, delighting in creation with the joy of the seventh day.

The literary interpretation presents us with the greatest meaning. It is a masterly, restrained vision from the human perspective to convey deeply thought-out ideas.

Creation and truth

As we move from the text of Scripture to the theories of science it is essential to establish what the fundamental biblical teaching about creation really is. The opening chapters of Genesis are clearly foundational statements about both cosmic and human origins. They come from ancient Hebrew culture and yet touch every culture. Their authority is linked with the person of Jesus who says they are the declaration of the divine Creator (cf. Gen 2:24; Matt 19:5).

However, clear teaching about creation is found throughout Scripture,[22] all of which must be used to formulate biblical doctrine.

- **Creation by God**

> 'By faith we understand that
> the world was created by the word of God.'
> (Heb 11:3)

These words distil the essence of all scriptural statements about creation. We are talking about a wonderful mystery, the true meaning of which is dependent on revelation not speculation, and can only be truly understood from the standpoint of faith; vital to remember when assessing the observations of science.

God alone creates. The divine command, 'Let there be!' can be linked with the divine name YHWH, 'the One who brings into being' (cf. Exod 3:13-15). Creation by God's 'word' breaks the primeval silence, an irresistible command that is demonstrated by the refrain, 'And it was so'. God alone gives form and gives being, God owes nothing to anything, having the absolute liberty of the Creator (Acts 17:27; cf. Isa 45:9). The creation by word is effortless,[23] but it is also the revelation of God's heart and communication of divine majesty and character. The work of creation is attributed to all the persons of the Godhead; the Father (Gen 1:1; Isa 44:24), the Son (Jn 1:3, 10; Col 1:16), the Spirit (Gen 1:2; Job 26:13). Creation is the work of the triune God.

Biblical creation proclaims one God creating everything; a striking contrast to the pagan myths. These ancient cosmologies resulted from the birth or the battles of the gods and tied the deity into the universe. Genesis, and the rest of Scripture, sees Yahweh free and distinct from the world, yet ruling and caring for it. There are biblical parallels to the

[22] cf. Isa 40:26, 28; 42:5; 45:18; Jer 10:12-16; Amos 4:13; Pss 8:3-4; 33:6-9; 90:2; 102:25; Job 38:4-11; 26:13; Neh 9:6; Acts 17:24; Rom 1:20, 25; 11:36; Heb 1:2; Rev 4:11; 10:6; etc.
[23] cf. Exod 34:10; Pss 51:10; 104:30; Isa 48:7; 65:17; Jer 31:22.

Mesopotamian myths but they are all polemical and marked by their distinctiveness rather than their similarities.

- **Creation *ex nihilo***

'By faith we understand that …
what is seen was made out of things which do not appear.'
(Heb 11:3)

These words affirm another truth essential to a biblical understanding of creation; that the cosmos was not made out of pre-existent material, but by the divine word alone. The Hebrew verb *bara* ('create') is powerful; it is used sparingly, and in this form, only of God. It is never connected with pre-existing material; it is a creative act that is supremely effortless and miraculous. On the basis of Gen 1:1 creation is *ex nihilo*, out of nothing.

This fact has some important implications:

- Matter cannot be eternal;
- There can be no dualism;
- There is distinction between God and creation.

However, it is only the primary act of creation that was *ex nihilo*; humans and animals were formed from the dust of the ground (Gen 2:7,19). These secondary acts of creation were from pre-existent materials.

Genesis 1 refers to the darkness (Heb *tohu*) and the deep (Heb *bohu*). Some have suggested that this is an oriental rhetorical way of saying 'nothing at all existed', but this is unlikely as they are named and used. The 'darkness-deep' is better understood as being created by God before the point at which the narrative begins. It has been well suggested that the story moves from 'chaos to cosmos' (Von Rad), rather than from 'nothing to something'. The interest of the story appears to be in 'form' rather than 'being'; it is form which makes the universe intelligible to us, and which we imitate in our six days.

- **Creation and *shalom***

'God is not a God of disorder but of peace.'
(1Cor 14:33)

The biblical declarations about creation gives a overwhelming sense of 'order' and *shalom*. From the earliest Genesis story the 'hosts' of created things throng and parade; 'creation is a diverse totality that is properly arranged, organised and differentiated'.[24] There is an inherent structure, which eliminates confusion. There is the 'separation', the 'classification' and the recurring formula, 'according to its kind'. Here is natural order, observed by and essential for science, established by God.

Amid the integration, the cosmos is vibrant. *Shalom* means fullness, the living God filling creation with life. This is the work of the Spirit, creating all things both 'good' and beautiful.

[24] Blocher, ***In the Beginning*****,** p. 71.

The fullness of the waters, the air and the earth is that which lives and which can itself create life. There is the glorious teemingness of life. Everything living converges towards human persons who themselves have a special relationship with creation and with God.

Embracing all this is the God who is, 'above all, through all and in all' (Eph 4:6). He is both transcendent and immanent within a creation that has as its purpose to display his glory.

- **Creation and science**

It really is an exciting time for Christians to be involved in the debate about God, science and creation. The heated disputes, which have characterised apologetics in the past continue vigorously, but they are now much less to do with a mechanistic approach to science and a literalistic interpretation of Scripture:

- Cosmology and the new physics suggest a development from simplicity to complexity in a way that implies more than just the repetition of chance processes;
- Quantum mechanics and chaos theory point to a breakdown of wholly mechanistic models of nature and towards a more human style of doing science.

Metaphysical and spiritual questions are being asked and discussed by scientists, philosophers, theologians and ordinary people with a new energy. There is no more agreement than before but there is a recognition that old positions will not do and new understandings must be sought. For Christians, this new openness on the part of many to consider the spiritual as well as the material dimensions of the cosmos is exhilarating, but also challenging. There are many references to 'God' but the content of the title is varied:

- The great uncaused cause
- The complete unified theory of science;[25]
- The 'soul' of the universe.

Much of the thinking, while turning towards spirituality, is turning away from a Judeo-Christian thought frame to that of the orient.[26] The Christian position continues to be seen as naive from the atheistic viewpoint and irredeemably mechanistic from the holistic perspective.

The challenge to Christians is fivefold:

- To redress the harm done in the 'science–Scripture' debate by a literalistic approach to the text;
- To explore the spiritual implications and challenges of the new physics;
- To challenge the 'reductionist-mechanistic' conclusions of atheistic science;
- To declare the true biblical character of God and his relationship to the world;
- To debate the nature of cosmic spirituality with holistic science.

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[25] e.g. Stephen Hawking, 'The purpose of physics is understanding the mind of God', quoted in ***Soul***, BBC, 1992.

[26] cf. Fritjov Capra, ***The Tao of Physics*****,** Wildwood House, 1975; Gary Zukav, ***The Dancing Wu Li Masters: An Overview of the New Physics*****,** Rider, 1979.

We have seen that our primary interpretation of Scripture must not be shaped by modern scientific hypotheses because the biblical authors knew nothing of them. However, it is important to critically assess current theories and reflect upon them in the light of biblical revelation. It is not easy to assess theories about the origin of the universe, of life and the human race; different scientific disciplines have to be understood, as well as those of biblical language and exegesis. Nevertheless, it is an essential task if we are to share truth with the world; it also beings deep enrichment within ourselves.

Cosmic origins

At the beginning of the 20th century it was generally believed that the universe was static and unchanging. The question of its origins, whether eternal or created, was philosophical and theological rather than scientific. Observations could account for either an infinite or finite cosmos. The universe was also believed to be only some 200,000 light years in diameter with just our galaxy and two smaller ones on either side.

- **Expanding universe:** In 1915, when Einstein formulated his theory of relativity he realised it implied an expanding universe, but because he believed the cosmos was static he built a 'cosmological constant' into his calculations. He was to consider it his greatest blunder! However, in 1922 Alexander Friedmann, a Russian physicist, took the ideas at face value and concluded that the universe must be identical in whatever direction we look and that we should not expect it to be static.

In 1929 Edwin Hubble made a landmark observation. New more powerful telescopes had begun to reveal huge galaxies deep in space, and the light coming from them was in the red end of the spectrum,[27] showing they were moving rapidly away from us and that space itself is extending outwards in all directions.[28] This means the universe is expanding; and there must have been a time, estimated at about 15 thousand million years ago, when all the matter in the universe was contracted to a single point of infinitesimal size and infinite density: singularity. This discovery brought the question of the beginning of the universe into the realm of science, suggesting it had an origin, called the 'big bang', and a possible ending.

In 1964 Arno Penzias and Robert Wilson were testing a very sensitive microwave[29] detector and began picking up a faint but persistent hissing noise. It was heard in every direction, day and night at all times of the year, showing that the position of the earth was irrelevant. Initially suspecting a malfunction they soon realised that it came from beyond the galaxy. In the 1960s scientists had predicted that if the 'big bang' were true there would be a relic of the original explosion in the form of background radiation; Penzias and Wilson realised they had discovered it! Subsequently, experiments into the distribution of hydrogen, helium and lithium in the universe have proved consistent with there having been a huge primeval explosion.[30]

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[27] Light waves from a receding source move lower down the light 'pitch' [red end of spectrum] proportional to the distance from the observer, so distance and speed can be calculated.

[28] Exactly what Alexander Friedmann had predicted

[29] Microwaves are like light waves but with a frequency of only ten thousand million waves per second.

[30] In 1948 Hermann Bondi, Thomas Gold and Fred Hoyle suggested the steady-state theory to explain the expanding universe; proposing that new matter was being created all the time to fill the space left by expansion. The universe would go on expanding but there would be very little change. This theory has been abandoned in the light of the above observations.

In 1974 John Mather suggested an experiment to NASA, which resulted in the launch of COBE (Cosmic Background Explorer). One of the persistent problems with the 'big bang' was how, from an explosion that must have produced a homogeneous haze of elementary particles, the forms of super-dense spinning stars, massive clusters of galaxies and finally living organisms developed. In 1992 the COBE star map gave us an image of the universe when it was a mere 300,000 years old. The cosmic background radiation is full of tiny ripples in the fabric of space–time producing a granulating effect; denser regions coalescing by the mutual gravitational attraction of subatomic matter. Huge fields of plasma, and later gasses, would have condensed, from which galaxies, stars and finally planets would have formed.

- **Beginnings:** Science presents us with a model of the universe, which moves from simplicity to complexity, from singularity to multiplicity. But in what way are we to understand its beginning?

In 1970 Roger Penrose and Stephen Hawking showed that the universe must have begun with a physical singularity. Hawking believed it was a kind of primeval black hole,[31] time and space, all energy and matter appearing abruptly without explanation. We can know nothing of what was 'before', there is no meaningful before. Hawking rejects the notion of a creator God. If we could observe an object entering a black hole, it would appear never to actually enter it. If creation is a kind of black hole in reverse then the actual beginning never quite happens. The universe starts just ahead of it; time emerges from an eternal state[32] in which the laws of physics exist without embodiment in a physical universe. Our universe is finite, but has no boundary, emerging unpredictably from an infinite, unbounded state.

To explain the possibility of this happening we are pointed to the subatomic quantum world where uncaused particles appear and disappear all the time. Cosmologists believe our universe began with a tiny disturbance in the quantum realm that exploded out of nothing to produce the driving expansion of matter and energy we experience today. To explain how this could have happened Alan Guth has proposed the 'inflationary hypothesis':

> "The early universe was 10–20 times smaller than an atomic nucleus and within the first 10–35 seconds the radius increased by a million million million million million times in a fraction of a second. This is inflationary expansion because it took place at an increasing rate then, not at a decreasing rate as now. The incredible rapid expansion is said to have been due to a supercooling effect in the universe that dropped the temperature without altering the symmetry between the forces of nature; like supercooled water can drop below freezing point without forming ice. The universe was in an unstable state with high levels of energy enabling expansion to occur."

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[31] Black holes are points of infinite gravity caused by the collapse of certain types of star; zero points from which nothing (light or information) can escape.

[32] Which Hawking calls 'imaginary time', ***A Brief History of Time***, Bantam, 1988, p. 134.

This attempts to explain the 'critical' nature of the 'big bang'. If it expanded too slowly gravitation would have caused it to collapse back into non-existence, too fast and it would have expanded uncontrollably before galaxies and stars could have formed.

Cosmologists such as Stephen Weinberg,[33] viewing the 'big bang' as a random event, see the possibility of our universe being just one of many bubbling up out of the quantum realm. This is only speculation and if it were the case they would remain completely unknown to us.

▪ **Anthropic principle:** One thing that has become clear from recent cosmology is how perfectly balanced the universe is to allow for the emergence of life. The forces of nature have combined within them a group of essential values that have enabled life to emerge and be sustained; slight variations would have made this impossible. Here are two of many examples:

- If the relationship between gravity and weak nuclear force had been slightly different the expanding universe would have collapsed in on itself or fragmented apart. The necessary conditions for the stability of life were laid down at the beginning;
- If carbon and oxygen, absent at the beginning, had not been formed in the great nuclear furnaces at the heart of the stars and scattered into space as they exploded, the essential elements of our bodies would have been absent. This debris contains the raw material of life.

The anthropic principle either fascinates or irritates scientists:

- Paul Davies[34] believes that the intricate balance suggests our own existence is written into nature in a fundamental way. A deep design is being worked out within the universe and our consciousness is part of that design. He does not assume an external creator, but that science points to an underlying cosmic order that makes our lives meaningful. As Einstein said, 'The most incomprehensible thing about the universe is that it is comprehensible.'

- Steven Weinberg believes that the universe does not recognise us or make allowances for us. We are accidental players in a cosmic tragedy that can only end in disaster of some form. The only reason the universe appears well designed is the fact that we are in it; if it were not so there would be no one to ask the question, 'Why is the universe like it is?' Everything is simply the fortuitous concourse of atoms. The statistical possibility of billions of other universes, each with slightly different laws acting, does not make our existence particularly unique.

▪ **Reflection:** The picture of the universe which is unfolding as a result of scientific observation is one that faith and spirituality can do business with. The sense of progress and development, the movement from simplicity towards complexity; none of this should surprise us. Nor should it surprise us that hypotheses hostile to any idea of the divine are developed from the data; this will also always be the case.

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33 ***The First Three Minutes***, Bantam, 1980, *et al.*

34 cf. ***God and the New Physics*****,** Pelican, 1983; ***The Mind of God***, Simon & Schuster, 1992.

What observations can we make so far?:

- A literary interpretation of Genesis will have no problems with the huge timescale involved in a scientific understanding of cosmic origins; however, a literal interpretation will have to find other explanations for the time–space phenomena, or discard them all together in the belief that sovereign acts of God, which defy scientific understanding, took place instead. We shall return to this subject below.
- A primary cosmic moment is exactly what biblical revelation declares. To describe this as a 'big bang' presents few problems, especially when we realise how conditioned the whole event was. As ever we accept scientific observations and conclusions as provisional; however, in broad terms the findings are not hostile to the expectations presented by Scripture.
- The nature of the highly controlled explosion which must have made up the 'big bang' in order for the universe to appear stretches the notion of chance to the limit. To find the perfect path between the more likely possibilities of collapse or over-expansion appears miraculous. Even if the 'inflationary hypothesis' is correct, we are still left with the question, 'Why?'. Paul Davies has said, 'The "big bang" singularity is the nearest thing in science to a supernatural event.'
- Stephen Hawking's idea, of an eternal state in which the laws of physics exist without embodiment in a real physical universe, suggests metaphysical language. Suggestions that cosmic origins are to be found in the spontaneity of the quantum world are exciting, but the notion that everything is thus the product of chance is flawed. Scientists, and some Christians, have a rather simplistic view of what divine involvement in creation must be like. Remember that a complete scientific explanation is not a full explanation; and that the interface between the spiritual and physical is subtle, tantalising, challenging and elusive.
- The anthropic principle is one of the most exciting areas of discussion. The sceptic can as we have seen, dismiss it, but the weight of probability against our universe appearing by chance makes it a very powerful encouragement to faith, especially when paralleled with biblical revelation.

Earth and ages

In 1654 Archbishop James Ussher calculated that God created the world in 4004 BC. The Cambridge scholar, John Lightfoot, was more precise in saying it took place at 9 a.m. on 23 October in that year. These bold and seemingly quaint computations should not be mocked. They were based on a literal interpretation of the biblical text and the genealogies found in Scripture,[35] and in the 17th century there was no understanding of geology in terms of rock strata laid down over periods of time.

When we talk in terms of millions of years in cosmology it is important to remind ourselves that the age of the earth has been, and often continues to be, a subject of huge debate between Christians and with scientists. It is a central issue if you take a literal interpretation of Genesis, and it has given raise to the 'gap' and 'vision' theories and helped shape 'concordist' ideas. While it does not directly influence a literary approach it is important to understand the issues.

[35] The liturgical calendar of orthodox Judaism has a date that is not too dissimilar.

▪ **Geology and time:** As we have seen, the big bang theory suggests that the universe has been expanding for some 15 billion years. Consequently, it is argued that Earth has existed for some 4.5 billion years, with its most ancient rocks being about 3.5 billion years old.

Geochronology has been estimating dates like this since the 18th century on the basis of numerous phenomena, but especially uniformitarianism. This is the idea that eras and ages can be identified on the basis of the arrangement of the layers of rocks; indications as to how they were formed and the parallel conformation of stratigraphic fossils provide specific and plentiful evidence of age.

Radiometric methods of dating have also been used in the last 30 years, to confirm or correct earlier statistics. They measure the passage of time by the constancy of speed at which radioactive elements break down. The breakdown rate of radioactive elements is known and invariable, whether uranium in rocks or radioactive carbon in plant or animal remains. (However, carbon dating is not accurate beyond 40,000 years.)

These kinds of dates are not a problem for Christians unless you insist upon a literal approach to the biblical text; those who do challenge the supposed findings of geology and vigorously promote the idea of a young earth.

▪ **Creation as it is:** A popular attempt by some Christians to overcome the huge ages proposed by science and yet face the reality of the material world is to argue that God created the earth to appear old. The mountains, the rocks, the deposits of oil and coal were all non-existent one day and created in their present form the next. The second Genesis narrative suggests Adam being created as a fully-grown person – why not the rest of creation?

This idea is first credited to Philip H Gosse in his book Omphalos in 1857, but has been frequently used since then, among others by orthodox rabbis. This is an intriguing approach, because as it is presented it is an closed circular argument which is quite unassailable as long as you stand within it. There is clearly no problem in believing that an omnipotent God could have created everything to appear as it does, and that the apparent scientific dating techniques are in fact meaningless. The question is whether this is what Scripture is requiring us to believe. Has God deliberately tried to confuse us? Is this his style?

Catastrophists: As we have seen, Creationists attack current scientific theory, and they are most vehement about geochronology, which they see as the major challenge to a literal understanding of the creation story. They are also often called ‘catastrophists’ because they believe the catastrophe of the Flood is the central and vital explanation of geological phenomena.[36] Creationists argue that the flood can account for the formation of the majority of the rocks and fossils, including rocks of biological origin, by the action of rapid agents such as marine currents. As far as radiometric methods are concerned a number of key assumptions are questioned:

- How can we be certain as to the original distribution of isotopes in the rocks?

[36] See George McCready Price, ***The New Geology***, 1923; H M Morris and J C Whitcomb, ***The Genesis Flood***, Presbyterian & Reformed, 1961.

- How do we know the rates of disintegration have not been variable?
- How can we be certain it has been a closed system with no other influences?[37]

▪ **Reflection:** It is unnecessary to introduce geochronology specifically into the biblical debate unless you insist on taking a literal approach to the text. We can make the following observations:

- The fact is that geology appears to be coming increasingly accurate in its calculations, and the notion of a global flood cannot account for all the data;
- The geological vegetable mass in the form of coal and oil is too great to be the result even of a global flood;
- The question has to be asked whether the biblical record demands a full global flood; it is written as an eyewitness report, and parts of the earth show no evidence of a flood, but many cultures have primeval flood stories;
- The signs favouring a young earth need to be properly assessed and understood but the evidence for an aged earth is many times stronger;
- The final figures for the age of the earth may well yet change but their huge scale is unlikely to be seriously diminished.

Life and evolution

The focus now falls on the complex question of the emergence of living matter and its transformation into the astonishing variety and complexity of living organisms we know today. The issues of the origin of life and the possibility of evolution require careful consideration.

▪ **Origins of life:** As we have seen, cosmology appears to have been able to describe the origins of the universe quite well, with observations by physicists seeming to confirm hypotheses. By contrast, biology is in a place of greater doubt regarding the origins of life. It is not due to a lack of interesting theories; it is simply the difficulty of demonstrating them.

We have already noted the idea that the essential elements for life were forged in stellar furnaces at the heart of stars, which ended their days in gigantic explosions called novae, or supernovae, billions of years ago. This seems a plausible scenario, but how the scattered elements came together in a unique configuration on an obscure solar planet we simply do not know. It remains one of the great scientific mysteries.

What is life? Living organisms are distinguished by their complexity and organisation; the simplest of them reveal a complex network of function and form. Yet each is organism is made up of perfectly ordinary atoms, none of which can be described as 'living' in them. How can a collection of inanimate atoms be living? There are two suggestions:

- **Vitalism:** the idea that there is an added 'life-force' to molecules in living organisms. It is hard to find any real scientific support for such an idea other than concluding simply that 'living things are alive' and inanimate things are not;

[37] See further Blocher, ***In the Beginning***, pp. 216-218.

- **Holism:** the idea that multi-component systems may collectively possess qualities that are absent or meaningless for the individual components. That the whole is greater than the sum of the parts is true, but how in essence does this come about?

The origin of life remains one of the great scientific mysteries. Only when molecules achieve a certain very high level of complexity can they be considered as 'living'; able to encode a large amount of information in a stable form, store the blueprint for replication and implement the replication. Can the transition across the threshold from inanimate to animate be understood in physical and chemical terms?

In 1953, Stanley Miller and Harold Urey tried to simulate the conditions scientists believed must have existed on Earth some 3.5 billion years ago with a 'primeval soup'. They obtained small amounts of amino acids when mixtures of hydrogen, methane, water and ammonia were stimulated with electric sparks. Such experiments have been greatly improved, but so far living molecules with the essential elements of life have never been produced in the laboratory. The task is to try to overcome the seemingly insurmountable obstacle that life requires enzymes and that enzymes are produced by life. Statistically the chances of the right combinations coming up by blind chance are virtually nil. There are two main responses:

- That the original self-replicating system, capable of development was very much simpler than hitherto imagined;[38]
- That the answer may be found in area of 'dissipative structures' where systems driven far from thermodynamic equilibrium spontaneously organise themselves in new ways.[39]

The questions remain. We stand on the edge of mystery and miracle. As with the big bang and the movement from nothing to something, so with the movement from inanimate to animate we see the hand of God. Even if a full scientific explanation is one day forthcoming we know that this will still be true, as it is with the whole of creation.

▪ **The idea of evolution:** [40] Following the questions about the origin of life come the questions about the origin of the great variety of plant and animal species we find on earth. The almost unquestioned position of the scientific community is that this is the result of the steady, developing, self-regulating process called evolution. Few subjects have created more bitter debate between Christians and scientists than this one since Charles Darwin published his ideas in *Origin of Species* in 1859.

The essential idea of evolution is that there are clear biological links between species; they share a common genealogy. That a whole variety of living organisms have appeared in succession, each having been produced by changes in earlier forms. All present and past living things are the spreading branches of a single tree of life.

Some simple starting questions are:

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[38] cf. R J Berry, ***God and Evolution***, Hodder, 1984, p. 99.

[39] cf. Paul Davies, ***God and the New Physics***, pp. 67, 69.

[40] This is a huge and complex subject to which we can give only the briefest of outlines. It is important to read around it much more widely, both scientifically and historically. A good starting point would be: R J Berry, ***God and Evolution***, Hodder, 1984, with extensive bibliography; V Blackmore and A Page, ***Evolution the Great Debate***, Lion, 1989.

- Why do all living things contain exactly the same complicated vitamins and enzymes?
- Why do all walking vertebrates have four limbs?
- Why does Australia have marsupials and not placental mammals?
- Why do some living creatures have vestigial organs?

Palaeontology, with its study of fossils, is said to give the greatest proof of evolution. Charles Bordet has said, 'The strongest argument in favour of transformationism is that none of the thousands upon thousands of fossils discovered and studied has ever been discovered outside its geological stage.'[41] Arranging fossils according to their similarities and timescale forms the pattern of the evolutionary tree. So strong do the arguments for evolution appear that it is now almost a statement of faith in modern scientific thinking.

The idea of evolution is not recent; it can be traced back to the early Greek philosophers about 550 BC. However, from the 19th century the ideas have been systematically developed. It is a fascinating story, but in its simplest form the key landmarks are:

- **Jean Lamarck** (1744–1829): One of the first biologists to firmly support evolution. Environment was the key influence. Need creates effort to bring satisfaction; effort becomes habit; habit modifies the organ and the change is transmitted to the following generation. His idea that learned physical characteristics in one generation are passed on to succeeding ones has, however, been discredited.
- **Charles Darwin** (1809–82): Viewed as the founder of the modern understanding of evolution, whose understanding of the mechanism of evolution was his great contribution. Characteristics are inherited from past generations but the key to development is natural selection. His key phrase 'survival the fittest' means 'reproductive success' with the passing on of all the inherited traits that led to that success. If there is variation among the individuals, survival will not be random and there will be evolutionary change. New aptitudes will soon be generalised throughout the species.
- **Gregor Mendel** (1822–84): He showed that heredity worked by passing on certain characteristics from one generation to another, not by a 'blending' of the characteristics in the offspring, but by some being dominant (seen) and others recessive (hidden), perhaps to appear in later generations. He also showed the importance of mutation.
- **August Weismann** (1834–1914): He showed that the 'soft inheritance' of Lamarck was wrong; individual acquired characteristics are not transmitted to descendants. He distinguished between phenotype [external form] and genotype (genetic make-up, unaltered by external modification). He re-emphasised that natural selection is central.

The early part of the 20th century saw the scientific community in considerable disagreement over evolution, but in 1942 a 'neo-Darwinian synthesis' emerged.[42] This drew together Darwin's 'natural selection' and Mendel's 'genetic inheritance' as complementary principles. It also recognised that evolution touched many scientific disciplines and so became an inclusive frame of thinking.

In broad terms evolutionary thinking is stronger today than ever before. In the words of R J Berry, 'There may be disagreement about the relative importance of particular

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41 Quoted in Blocher, ***In the Beginning***, p220.

42 Largely summarised in Julian Huxley's ***Evolution: the Modern Synthesis***, Allen & Unwin, 1942.

mechanisms but there is no viable alternative to Darwinian evolution for under-standing nature … evolution is to biology what the Periodic Table is to chemistry.'[43]

▪ **Debating evolution:** There was a storm of debate when Darwin published his Origins, and it has smouldered ever since, flaming vigorously from time to time, especially since the 1960s with Creationism. There are numerous issues, too many to address in detail. We shall take the most persistent and consider the replies of the evolutionists:

- **Theory**: It is argued that 'evolution is only a theory', but like all scientific theories is constantly being tested, adjustments are being made and so far it seems to make most sense of the data. It could have to change radically one day, but so far it seems broadly secure. It is important to distinguish between evolution, which is a science and 'evolutionism', which is a philosophy and not a science.
- **Unscientific**: It is argued that evolution is not 'falsifiable', an essential quality of a scientific theory. However abnormal the mutation, some explanation for its value will be given! The reply of the evolutionist is that only time will tell if it will be useful or not.
- **Time:** it is argued that the probability of chance bringing into existence the present wealth of fauna and flora is mathematically impossible. The generous amounts of time given by science simply are not generous enough for Darwinism. It is estimated that even with a billion attempts a second it would take billions and billions more time than the billions of years estimated to be available. The evolutionist replies that to think like this is to misunderstand the role and power of natural selection that progresses by a cumulative process. New forms that have an advantage survive while the others are more at risk and probably die out; changes taking place steadily and progressively. It is even believed that natural selection may occur at a molecular level [some bonds easier to form than others]. It is argued that all this would be feasible in the time available.
- **Entropy:** It is argued that evolution runs counter to the second law of thermodynamics, which states that 'disorder increases in any system over a period of time'. Evolution declares increasing complexity; entropy displays increasing chaos. This is certainly true in a closed system that receives no energy from outside, but the natural world is an open system. There is input from the sun and the energy exchange between living organisms and their surroundings is great; it is believed to decrease entropy sufficiently for evolution.
- **Fossils:** It is argued that the fossil record is flawed. Creationists believe that the Flood disrupted the whole geological order so that it is no basis for calculation. Added to this it is claimed that a circular argument is used for chronology: the fossils are dated by the rocks and the rocks are dated by the fossils. Scientists refute this, saying fossil distribution is always the same wherever it occurs and so we can infer that all rocks with the same fossils in them are the same age.
- **Taxonomy:** It is argued that the classification of plants and animals is a subjective exercise based on common agreement between specialists. Over the years they have tried to make their groupings more exact. One development has been 'cladism' which makes no attempt to build ancestral relationships between species, but simply record the number of characteristics shared with similar species. Evolutionists see it as unhelpful. The fundamental principle is that there can be only one true historical development of an organism, and it must be sought.

[43] Both a Christian and a Professor of Genetics in University College, London; see p. 88, 121.

- **Species:** It is argued that the one thing Darwin did not discuss in his Origins was the origin of species! The very word 'species' is filled with difficulty:

  - Is it the same as the biblical word 'kind'?
  - How do you draw the lines between them?

These are difficult questions to answer for many reasons and must remain fluid, but a working definition would be 'groups unable to cross breed successfully'. Very few people dispute *microevolution*, change and development within species. However, *macroevolution* (speciation) – the emergence of a new species – has been more contentious. Disputed by many, evolutionists argue for it on the basis of a virtual uniformity of the genetic code in all living things, which suggests they are all descended from a single, or limited, origin. Speciation is said to have been observed with:

- Diptera snails;
- Cichlid fish;
- Drosophila.

The fossil record suggests persistent forms for long periods of time, with sudden replacement with similar but distinct forms (species). This phenomenon is called 'punctuated equilibrium'; it suggests that evolution took place at different rates, with different groups, at different times.

Missing links do occur, although they are rare. Several hundred transitional forms have been documented,44 many moving between higher groups. We would not expect to find many because by their very nature they would be few in number, creating a 'bridge' to the next species.

▪ **Reflection:** A literary approach to the biblical text certainly allows for biological evolution, and there is nothing in the Genesis text for or against it.[45] Some believe that the commands in 1:11, 20, 26 actually suit evolution. However, the subject requires constant discussion, reflection and review in the light of ongoing advances in both scientific and biblical understanding:

- Evolution is a scientific theory; however strong it appears, it is always provisional and open to modification and even radical change. The questions raised by Creationists are important for they remind us of the ongoing nature of science and the dangers of 'evolutionism'. However, the flaw of Creationism is that it is built of scientific anomalies and questionable biblical interpretation. Evolutionary science does face serious, though probably not fatal, questions; entropy, time and chance, macroevolution and punctuated equilibrium, among others, all continue to be areas of debate.

- Evolution and paleontology raise some important questions about suffering and death before the Fall. There is death and predatation at the heart of evolutionary theory and the fossils show that dinosaurs suffered from cancer and arthritis. Added to this the first Genesis narrative suggests that God's intention for human and animal was a vegetarian diet:

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44 cf. R J Cuffey, ***Journal of American Scientific Affiliation***, 1972, quoted by R J Berry, p. 117.

45 cf. D Kinder, ***Genesis*****,** p. 28.

> ‘And God said, “Behold, I have given you every plant yielding seed which is upon the face of the earth, and every tree with seed in its fruit; you shall have them for food. And to every beast of the earth, and to every bird of the air, and to everything that creeps on the earth, everything that has the breath of life, I have given every green plant for food.” And it was so’. (Gen 1:29-30)

The Bible says very little about the presence or impact of evil before the Fall. Nature reveals there was death and disease before the emergence of human beings; how are we to understand this as part of a ‘good’ creation? Nature reveals predatation from the earliest stages of animal development; how are we to understand this in the light of the seeming vegetarian mandate? Paul speaks of God ‘subjecting creation to futility … in hope’ (Rom 8:20). The issues are far bigger than we can deal with here; they require careful biblical interpretation, and suggest real and sustained humility in our whole approach to God and creation:

• Evolution appears to pose moral questions about human behaviour if nature is just ‘red in tooth and claw’. This of course is the conclusion of the philosophy of ‘evolutionism’; not the science of evolution, which is incapable of moral observation. This is why revelation is so vital. We see this struggle in the writings of Jacques Monod and Richard Dawkins [46] who see humans needing to take a stand above mere evolutionary forces and choosing truth and altruism!

• Evolution continues to challenge our understanding about God’s relationship to the world. By whatever means living species unfolded it was within a pattern of principles that have brought beauty and purpose, and underline sovereignty throughout creation.

Human origins

The coming into being of the distinctively human person, like us, is a subject of great importance. Scripture stresses our links with the material world, ‘made from the dust of the earth’, and we are aware of the similarities between us and other living creatures. However, our uniqueness is also stated; we are ‘made in God’s image’, and we are aware of the differences between the animals and us. The image of God in us is clearly not our physical form, but is to do with our essential nature in personhood and spirituality. It is also seen in our self-expression in morality, sexuality, storytelling and much more. Are these distinctives simply the result of brain development or a fundamental difference in essence; the mark of the divine?

▪ **Pathway to Eden:** The story is still shrouded in mist and mystery. What we can say though is that the modern scientist no longer says, ‘Humans are descended from apes.’ Instead, it is suggested that humans and apes probably shared a common ancestor Dryopithecus who lived some 8 million years ago; but even these theories are built on the most slender evidence with huge gaps in the chain:

- **About 1,000,000 years ago** *Homo erectus* lived; their cerebrum had convolutions, and they had a skull volume and shape placing them about halfway between Homo sapiens

[46] cf. Jacques Monod, ***Chance and Necessity***, Collins, 1972; Richard Dawkins, ***The Selfish Gene*.**

and anthropoid apes. An erect walker, meat eater, tool maker; physically not very different from ourselves;
- **About 30,000 years ago** *Homo sapiens* fossils (Cro-Magnon) lived; they were practically indistinguishable from ourselves in form. Their industry and art show a resemblance to us and they had religious preoccupations;
- **About 10–12,000 years ago** *Homo sapiens* lived as Neolithic peoples, a civilisation involving cattle, agriculture and later metal work.

E K V Pearce[47] has made a strong case for biblical Adam being a Neolithic farmer on the slopes of the Turkish plateau about 10,000 years ago. The Genesis story fits well; vegetation would have been tundra (2:5), with glacial rivers (2:6), forming oases that attracted animals (2:19). The word '*Eden*' could come from the Babylonian *edinnu* meaning 'plateau'. There are three references to Adam and agriculture [cf. 2:15], he is no longer a hunter-gatherer. There is the development of towns [4:17] and metalworking [4:22]. It is a persuasive suggestion.

▪ **Reflection:** Our assessment of human origins does have to be done very carefully because there are significant spiritual, theological and ethical issues involved.

Creationists reject any connection between the creation of the animal species and that of human beings. They challenge the timescale involved, and they say that the bones discovered are simply diseased forms of human remains. The 'image of God' demands that a human person is a distinctly, uniquely and divinely created being.

What observations can we make regarding human origins?

• There are definite physical and even psychological links between us and other primates; even the genetic codes of a chimpanzee and a human differ by less than 2 per cent. This should not surprise us. The differences, however, are even more remarkable. To what extent science could be expected to describe the 'image of God' is doubtful. The similarity and difference together point towards something divine.
• There is a clear statement in Scripture that something dramatic happened to bring into being full personhood in the 'image of God'. It was either a separate creative work, or it was a development from other animal species to full humanity. If it was the latter there must have been other 'human-like' beings existing at the same time from which God chose a particular couple. A 'garden east of Eden' could imply separation and isolation. The breathing in of God's Spirit is nothing less than a 'primeval pentecost'.
• There seems to be fascinating evidence for an original man and woman, and there are few doubts that *Homo sapiens* has a single origin:

- Work on biochemical variants suggests that the human species may have comprised a single pair for one generation sometime during the past million years;
- Work on an international assortment of genes suggests that there is a single woman, some 200,000 years ago, from whom all humans are descended.[48]

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47 cf. ***Who was Adam?*,** Paternoster, 1969.

48 cf. RJ Berry, p. 72 and '***The Search for Adam and Eve'***, *Newsweek*, 11 Jan 11 1988.

- The timescales are out if Adam is to be interpreted in a Neolithic context, for by this time *Homo sapiens* were Indians in America and Aborigines in Australia; but who knows what future observations will bring.
- There seems to be a demand in Scripture for an original man and woman and a unity of the human race,[49] especially in terms of their sin and rebellion and the effect on the human race. If this is to be understood in terms of a hereditary and genetic unity, which is the simplest interpretation, then special creation must have involved an original pair alone to whom all can be traced back. If, however, it can be understood in terms of solidarity rather than heredity, and spiritual unity rather than a genetic unity, then what God does in giving the unique couple federal leadership of humanity extends 'outwards' to their contemporaries as well as 'onwards' to their offspring.50
- The creation of woman from Adam's rib (Gen 2:21) is almost certainly a statement of the relationship between the two of them, rather than a literal description of what happened. They share physical identity and biological harmony. In Arabic 'my rib' means 'my friend'; in Sumerian the word 'rib' also means 'life'. It is interpreted by the storyteller in the marriage cry, 'bone of my bone and flesh of my flesh' (v23). The name, 'Eve – mother of all living' (v20) may refer to her as source of all human children (DNA pointing in that direction) or, in the context of the curse, point forward to the promise of salvation and redemption.

Conclusions

When you look at the enormous scope of our topic, 'God and Creation'; you are struck by the simplicity of the biblical detail against the complexity of the scientific data. For all the observations of cosmology and biology, the divine declarations are profound. In both nature and Scripture we are handling the truth, but the biblical text alone gives us perspective. The sciences will continue to unravel mysteries, but without the backdrop of revelation we would be overwhelmed by human insignificance and meaninglessness. The findings of science challenge us to think in fresh ways, but it is Scripture that breathes life. Science and faith are not in conflict; together they inspire humility and worship.

- One of the most important issues highlighted by this subject is how we understand God's relationship to creation. It is remembering that even if you are able to give a complete scientific explanation of something you have not excluded God, you have touched on meaning. It is easy to look at the great crises of creation – matter: nothing to something; life: inanimate to living: personhood: animal to human – and see God there. But God is actually in the whole, not just in the parts. Any other approach makes him the 'God of the ever decreasing gaps'.
- Could you scientifically observe when a miracle has taken place? Sovereign acts of God leave their mark but do so in harmony with natural laws he has created. To observe the result of a miracle would leave you looking at something normal under extraordinary circumstances (e.g. a blind person who can see will look like any other sighted person). God always gives people an alternative choice about the cause of miracles, but in reality they are a miracle.

[49] cf. Rom 5:12,17; 1 Cor 15:21,45; Acts 17:26.
[50] See R J Berry, pp. 70-74; D Kinder p. 30.

Science alone can fascinate but leaves a person confronted with a void without and contending with a void within. Infused with revelation science inspires the cry:

'O come, let us worship and bow down,
let us kneel before the Lord, our Maker!'
(Psalm 95:6)

Questions

1. How important are the statements of Scripture in shaping our understanding of creation? Why are they so important and what distinctive contribution do they make?

2. If scientists could give a complete explanation to the origins of creation, would that affect your belief in God as creator? How would you answer a sceptic who believed it should?

3. Christians are expected to read both 'the book of scripture' (Bible) and 'the book of nature' (Creation). God has brought them both into being. What do we need to be aware of when reading both 'books' side by side? Do they contradict or complement each other? What does this reflection suggest to us about the relationship between science and faith?

Reading and Resources

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