

Faith&Thought



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In this issue:

- **Evolutionary Theory for the 21st Century Church
Reflections on Dr. John Weaver's Paper
- Terence C. Mitchell**
- **Darwin: Bane or Blessing - Chris Knight**
- **Another Look at Mature Creation - P. G. Nelson**

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Contents

Editorial		1
Evolutionary Theory for the 21st Century Church. Reflections on Dr. John Weaver's Paper	Terence C. Mitchell	3
Darwin: Bane or Blessing?	Chris Knight	12
Another Look at Mature Creation	P.G. Nelson	22
Book Reviews		29
Application for Enrolment		43

Editorial

The Christian love-hate relationship towards Charles Darwin shows no signs of abating. The bi-centenary of Darwin's birth understandably produced a spate of books on Darwin and evolution, two of which are reviewed in this issue. To celebrate the bi-centenary we published an article by Dr. John Weaver on evolutionary theory in the 21st century. Terence Mitchell, a member of the council of the Victoria Institute, has written a response directed at his treatment of the biblical data. We also invited readers to write an essay on the subject of 'Darwin, Bane or Blessing?' and we include one such contribution from Dr. Chris Knight, who is involved in research for the Wellcome Trust. Our final article is from Dr. Peter Nelson, who used to teach chemistry at Hull University. He looks afresh at the subject of mature creation that was popularized by one of Darwin's contemporaries, Edmund Gosse, who believed he had solved the problem of reconciling the vast ages required for evolutionary theory with the short time he believed the Bible envisaged since the creation of the world. Gosse's son Edmund said that his father waited in a fever of suspense for the publication of his book which "...was to bring all the turmoil of scientific speculation to a close, fling geology into the arms of Scripture and make the lion eat grass with the lamb." However Edmund claimed that, "...atheists and Christians alike looked at it and laughed and threw it away." However it did not go away and creationist writers still use his arguments.

2 FAITH AND THOUGHT

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Evolutionary Theory for the 21st Century Church Reflections on the 2009 Paper of Dr John Weaver

Terence. C. Mitchell

I would like to offer some comments on Dr John Weaver's paper "The Challenge of Evolutionary Theory for the 21st Century Church", which appeared in *Faith & Thought* 46 (2009), because in it he shows rather more certainty in some of the positions he takes up than I would have thought justified by our knowledge of the evidence.

I will leave on one side his speculations about the evolution of living species, and will look at the Biblical side. Concerning this, he appears to assume that the text of early Genesis dates from the Exilic period, when, according to him, a "priestly writer, or group of writers, reflected upon their faith, the writings that the religious community had preserved and brought with them into exile, and upon the history of God's dealings with his people. To this they added their experience of the world, and the religious views held by their Babylonian captors. The writers took all these experiences, and, through their faith in Yahweh, a newly edited version of the scriptures took shape" (pp.10-11). I would argue that in this he takes an unnecessarily low view of the inspiration of the text. This may be an unfair assessment, and he may take a higher view than is implied by his presentation, but the rather woolly statement that the priestly writers prepared the text "through their faith in Yahweh" does not make the matter clear.

Christianity with its Old Testament forerunner is a supernatural religion, and it is best to acknowledge this in dealing with the question of Biblical inspiration. It is clear from manuscript evidence, of course, that both the Old and New Testaments have been subject to scribal errors and updating in the course of transmission. Scribal updating, for instance, could account for such passages in the Pentateuch as those apparently presupposing Israel's occupation of Palestine, later political situations, or suggestions that the author lived later than the Mosaic period.[1] The Biblical writers clearly sometimes made use of existing written sources, but it is reasonable to assume that the resulting text "as originally given" was the product of revelation, not merely of human deliberation. A considered expression of the meaning of revelation was given many years ago by the American scholar J. Gresham Machen who held that "the Biblical writers, after having been prepared for their task by the providential ordering of their entire lives, received, in addition to all that, a blessed and wonderful and supernatural guidance and impulsion by the Spirit of God, so that they were preserved from the errors that appear in other books and thus the resulting book, the Bible, is in all its parts the very Word of God" [2] He duly followed this statement with a clear explanation of the hazards of subsequent scribal transmission.[3] In this context, Dr

4 FAITH AND THOUGHT

Weaver's apparent assumption that "the religious views held by their Babylonian captors" were worked into the Bible text implies a very dubious view of inspiration.

Dr Weaver does not define what he means by "the writings that the religious community had preserved", but these would presumably have included the early chapters of Genesis. Concerning Genesis 1-11 there is still much we do not understand in the interpretation of the text, nevertheless, when he states that it is "important" to hear the views of "early Christian theologians such as Origen, Jerome, Gregory of Nyssa, Ambrose, Augustine and many Jewish scholars of the time" (p.10), it is questionable whether these views are really helpful.[4] It is improbable that such early scholars had any better understanding of the Hebrew text than we can have today with our knowledge of the ancient near eastern context. There has been much new information from inscriptions throwing light on Hebrew and other ancient languages, on ancient literary forms, and on the ancient Near East in general, which would have been unknown to them. In spite of this, of course, uncertainties remain.

Professor K.A. Kitchen has given a reasoned analysis and assessment of these chapters in the context of ancient near eastern evidence, showing good reason for treating the Pentateuch as a unified literary composition, rather than an allegedly later combination of originally separate documents covering the same ground, sometimes in parallel and even in conflict, as assumed in the old Documentary Hypothesis.[5] which appears to lie behind Dr Weaver's position.[6] Comparable early extra-Biblical material demonstrates that the Biblical record could have existed at the same time, without having been directly influenced by it.

The Documentary Hypothesis, some form of which appears to be assumed by Dr Weaver, proposed in its basic form that the Pentateuch was made up of successive hypothetical Documents designated J, E, D and P, in which P (editorial linking of the "previous" documents with additional material) was allegedly the work of priests in the Exilic period, c.5th century B.C.[7] The dating of these documents rests on the assumption, taken up already at the beginning of the 19th century by W.M.L. de Wette (1780-1849),[8] that the "Book of the Law" found in the Temple in the time of Josiah (2 Kings 22), was essentially the book of Deuteronomy (D).[9] This was a reasonable enough proposal, but the associated presumption that the book had been recently written at that time (the 7th century B.C.) is a different matter. Concerning this assumption, I quote comments I made elsewhere about the Book of the Law: "... the description of its discovery and use suggests that at that time it had the appearance of age, being immediately accepted as authoritative, and that those who discovered it, who made it known to the king, and who participated in the actions to which it led, were presumably honest men. It is unlikely, therefore to have been a recent compilation expressly placed in order to be found, pseudo-accidentally, soon after its deposit." [10] The questionable theory that Deuteronomy was compiled in the 7th century, half a millennium later than the time of Moses, with whom (apart from a concluding section

by a later hand) it purports by implication to be connected, was associated with the dating in the first millennium B.C. of the other suggested “documents”.

This Hypothesis, which followed on from various other contributions, was the result of analysis which had a detached character, in that it was based on speculation in the air, so to speak, with no effective contact with the actual ancient world. It was put in apparently convincing form, taking the idea of separate documents, together with the additional element of development or evolution of religious understanding,[11] by Julius Wellhausen (1844-1918) in three journal articles published in 1876 and 1877, reissued subsequently, with *Nachträge und Bücher*, in his volume *Die Composition des Hexateuchs und der historischen Bücher des Alten Testaments* in 1889,[12] his suggestions already having been followed up in his volume *Geschichte Israels*, 1 (Berlin, 1878).[13] His sequence of “documents” is still widely followed in the higher critical sphere, where, taking D as composed in the seventh century, J and E are placed only a century or two earlier, and P in the Exilic period.[14] Wellhausen’s publications were prepared at a time, not long after the definitive decipherment of cuneiform in 1857, when the evidence being obtained from Babylonian and Assyrian texts was in the early stages of study. Though in 1872 Eberhard Schrader had published the first edition of his influential volume *Die Keilinschriften und das Alte Testament*, there is no indication that Wellhausen took account of it,[15] and in any case this was early in the period when material relevant to Biblical studies was being opened up by George Smith. It was in 1872 that Smith discovered fragments of the famous Flood Tablet in the British Museum. He published these in 1873 and 1874,[16] and in his book *The Chaldaean Account of Genesis* in 1875, which appeared in a German translation in 1876. The Flood Story, an important example of the kind of contribution this material could make, had, of course, an obvious relevance to early Genesis, and in the second edition of *Die Keilinschriften und das Alte Testament* (1882) Schrader included citation of it, known at that time only from Assyrian tablets of the 7th century B.C.[17] That this was still in the pioneering stage of cuneiform study is shown by the fact that the first standard grammar of Akkadian, the *Assyrische Grammatik* of Friedrich Delitzsch, was not published until 1889. This kind of evidence was bringing new elements into the speculation, but Wellhausen took no account of it, and indeed concerning Assyriology T.K. Cheyne, a contemporary and an enthusiastic adherent of the higher critical view of the Old Testament, says of him that “he displayed an excessive distrust of that study”.[18] In any case, by this time other matters were engaging his attention. In 1883 he resigned his Chair of Theology at Greifswald because he had come to feel that he could no longer prepare men for the Protestant ministry. He took up Professorships in Semitic Languages at Halle and then at Marburg, and, though he remained on the margins of the Old Testament field, he turned his main attention to Arabic studies, publishing *Muhammed in Medina* already in 1882 and *Reste arabischen Heidentumes* in 1887, transferring subsequently to the New Testament field. The fact

6 FAITH AND THOUGHT

that he moved into Arabic studies demonstrates his background in the academic world of the nineteenth century, when scholars who intended to specialise in the Old Testament made a special study of Arabic, as the fullest source, with Syriac (Christian Aramaic), of Semitic comparative material for the Hebraist.[19]

In the generations since the Assyrian Flood tablets and similar first millennium texts came to light in the late 19th century, many new discoveries have been made, including for example two Flood texts (Atrahasis and Ziusudra) of the early second millennium.[20]

Apart from the study of Assyrian and Babylonian texts, it should be born in mind that in the early days of speculation about the Old Testament it was possible to assume that writing was not known among the early Hebrew people. At much the same time as the opening up of the cuneiform inscriptions, discoveries of alphabetic inscriptions in Palestine were demonstrating the possibility of early literacy. Already in the period when Wellhausen was working on this material, the discovery of the Moabite Stone (1868),[21] the so-called Royal Steward Inscription now in the British Museum (1870),[22] and the Siloam Inscription (1880),[23] were beginning to demonstrate the use in Palestine of alphabetic writing for Hebrew and related languages as early as the 9th century B.C.[24] Further, what Wellhausen and his immediate successors would not have known, and what has been barely recognised today, is that discoveries in Palestine have demonstrated the existence of a linear (pictographic) Canaanite alphabet already by the 16th or even 17th century B.C.,[25] clearly a forerunner of the Phoenician and Archaic Hebrew alphabets, well before the time of Moses. This kind of script had developed by the 12th and 11th centuries into a simpler form not greatly different from that in use for Hebrew in the pre-Exilic period.[26]

The basic idea of the Documentary Hypothesis goes back to the early nineteenth century when knowledge of the ancient near east was very limited, but I have concentrated on Wellhausen because he was particularly influential in the field of Old Testament Studies. Since his time speculation has continued on similar lines and the Hypothesis has gone through many variations, sometimes with superficial attention to ancient near eastern evidence,[27] but questioned at many points.[28] Nevertheless, still in 1998, in the Preface to his book *The Pentateuch in the Twentieth Century. The Legacy of Julius Wellhausen*, E. Nicholson states his opinion that “the Documentary Hypothesis should remain our primary point of reference, and it alone provides the true perspective from which to approach this most difficult area in the study of the Old Testament.”[29]

As mentioned above, a significant factor in this Hypothesis is the belief that there is an evolutionary element in religion. The idea of human progress was widely held in the 19th century, reinforced in 1859 by the publication by Darwin of *The Origin of Species*. [30] This means that behind the Documentary Hypothesis is the assumption

that human institutions and religious understanding have developed and improved. In fact, anyone who makes a careful study of the ancient world finds that, though technology or material culture (to use the anthropological term) has changed and developed over time and varied from place to place, the moral or ethical condition of man has changed in no respect whatever.[31] This is clear also from the fact that the Christian knows that the spiritual teaching of the Bible is just as valid today as it was two millennia and more ago.

It is clear of course from the Bible as a whole that in God's dealings with man there has been progressive revelation (e.g. the sacrificial system > the tabernacle > the temple > the substitutionary death of the Messiah),[32] but this refers to spiritual life, and is quite different from the secular idea of moral or ethical evolution in human history.

The point I wish to make is that Wellhausen, whose work rested on that of earlier scholars, had no useful contact with knowledge of the environment of the ancient Near East,[33] and it could be argued therefore that the continuing acceptance of his approach is unrealistic and out of date. There is much speculation in it and its elaborations. If it comes to speculation, however, the sixty-year-old volume *A Short Introduction to the Pentateuch* of G.Ch. Aalders (Tyndale Press; London, 1949) gives a perfectly plausible analysis of the literary arguments in favour of treating the Pentateuch as a unified composition, material revisited thirty years later in his popular commentary on *Genesis*. [34]

Speculating further, from an archaeological point of view, it is a quite tenable hypothesis that the material in Genesis 1-11 could have been carried out of Mesopotamia in the early second millennium B.C. by Abraham inscribed in the cuneiform script in the Babylonian language on clay tablets. In such a hypothesis, the early part (much of chapters 1-2), which would have been known only by direct revelation rather than human observation, and then passed down orally, would not have been in Babylonian originally, and there is no way of knowing what form the first language would have taken. Techniques have been developed in the field of linguistics for reconstructing earlier stages of a language not preserved in writing.[35] Analysis of the Semitic languages suggests that Proto-Semitic and its forerunner Proto-Afro-Asiatic (or Afrasian[36]) can be postulated back to perhaps the 5th or 6th millennium B.C., but there is no precise evidence to indicate what the linguistic situation would have been before that. Similarly, concerning the other great language family of the ancient western world, Indo-European, the evidence cannot give an indication of the form of its forerunner, Proto-Indo-European, earlier than about the 5th millennium B.C.[37] This ignorance of the early language situation means that in interpreting Genesis 1-10 the normal methods of Semitic philology may not be appropriate. The text from chapter 3 onwards could be, plausibly, a record of human experience, with the contents of the later chapters 11, and possibly 10, recorded directly in Babylonian

8 FAITH AND THOUGHT

cuneiform. Writing only came into use in Mesopotamia and Egypt two or three centuries before 3000 B.C., and for literary texts only from about 2600 B.C.,[38] so material relating to times earlier than that would have been passed down orally for several generations. In preliterate societies oral transmission can be accurate, and, compared with the Avesta or the Qur'an which in different ways have been memorised, Genesis 1-11 would not have presented a formidable amount of text to commit to memory, so from that point of view it's transmission could have been reliable.

Pursuing the speculation, it is possible that this material could have been in the hands of Moses, who may be dated plausibly in about the 13th century B.C.,[39] and who, apart from a knowledge of Egyptian and probably Babylonian (which was certainly known in Egypt in the 14th century B.C. as demonstrated by the Amarna Letters), could have retained use of the Canaanite dialect ancestral to Hebrew, possibly brought by the Patriarchs to Egypt from Canaan. With these resources he could have made use of the early records in Babylonian cuneiform (Genesis 1-11), together with those of the Patriarchs in Canaanite (Genesis 12-36, 38) and hieroglyphics (Genesis 37, 39-50), to write the bulk of Genesis (and the rest of the Pentateuch) in proto-Hebrew and an early form of the alphabetic script. This is speculation, of course, and some may think it too credulous, but the views espoused by Dr Weaver are also speculative, and I put the other kind of possibility in order to suggest that dogmatism is unwise.

[1]References conveniently in G. Fohrer, *Introduction to the Old Testament* (London, 1970), p.107. For simplicity I refer particularly to this work, which lies in the Higher Critical tradition, because it provides useful detail and cites contributions from scholars with different views. On references of this kind, see also B.K. Waltke, *Genesis. A Commentary* (Grand Rapids, 2001), pp.25-26.

[2]J. Gresham Machen, *The Christian Faith in the Modern World* (Philadelphia, 1936; reprinted Grand Rapids, 1965) [originally radio talks], pp.36-37. In this context, compare for instance, Paul's statement at Galatians 1:12 about his gospel, "I did not receive it from any man, nor was I taught it, but I received it through a revelation of Jesus Christ."

[3]Gresham Machen, *The Christian Faith*, pp.37-44.

[4]The character of their comments may be judged from a selection of translations from their writings in A. Louth (ed.), *Ancient Christian Commentary on Scripture, Old Testament, I, Genesis 1-11* (Downers Grove, 2001).

[5]*On the Reliability of the Old Testament* (Grand Rapids and Cambridge, 2003), pp.421-447, with assessments of prominent higher critical treatments of the Hebrew Bible, pp.449-500.

[6]Waltke also surveys this material (*Genesis*, pp.23-24), though his implication that Moses drew upon such pagan literature, and his suggestion that Genesis 1-11 is a polemic against such myths, is unnecessary.

[7]E.g. Fohrer, *Introduction*, pp.185-186.

[7]In *Beiträge zur Einleitung in das Alte Testament, I-II* (Halle, 1806-7), published when he was in his mid-twenties.

[9]Fohrer, *Introduction*, p.167. This connection had been suggested already in the 4th-5th

centuries A.D. (Athanasius, Jerome, and Chrysostom), p.167 with n.1.

[10]T.C. Mitchell in *Cambridge Ancient History*, III.2 (1991), pp.387-388.

[11]On this see e.g. W.F. Albright, *Yahweh and the Gods of Canaan* (London, 1968), pp.1 with n.3 (referring to the “unilinear system of religious evolution” put forward by Wellhausen), also 25-26, and 230 note a; and E.G. Kraeling, *The Old Testament Since the Reformation* (London, 1955), pp.73, 94 (referring to Wellhausen’s *Geschichte Israels* as having “marked the beginning of a completely secular and evolutionistic study of the Old Testament sources.”); this point is made also by G.T. Manley, *The Book of the Law. Studies in the Date of Deuteronomy* (London, 1957), pp.13-14.

[12]The articles, which appeared in the *Jahrbuch für Deutsche Theologie* 21 (1876), pp.392-450, 531-602; and 22 (1877), pp.407-479, are conveniently summarised in J.W. Rogerson, *Old Testament Criticism in Nineteenth Century England and Germany* (London, 1984), pp.260-264; the page numbers of these articles are given in the margin of the *Composition des Hexateuchs*. His proposed sequence of “documents” (J, E, D, P) was a rearrangement from E¹, E², J, D, the previous state of the theory (i.e. J, E (former E²), D, P (former E¹)). On Wellhausen more generally see Rogerson, *Old Testament Criticism*, pp.257-289.

[13]In it the Pentateuch and Joshua (the Hexateuch) are dealt with in pp.311-376; the volume was reissued in 1883 under the title *Prolegomena zur Geschichte Israels*.

[14]Fohrer places J between 850 and 800 B.C. (*Introduction*, pp.151-152). E in about 780-750 B.C. (p.158), and P in the 5th century B.C. (p.185). In Fohrer’s summary Genesis 1-11 is divided between J and P, with nothing assigned to E or D. For these chapters he gives the division as: **J** (2:4b-3:24 [Creation and Fall]; 4:25-26 [Descendants of Seth]; 6:5-8; 7:1-8:22 (+ some P) [Flood]; 9:18-20, 28-29 [Shem, Ham and Japheth]; 10:8-19,21,24-30 [Table of Nations]; 11:28-30 [Genealogy of Abraham]); and **P** (1:1-2:4a [Creation]; 5 [Genealogy of Seth], 6:9-8:22 (+ some J) [Flood]; 9:1-17 [Covenant with Noah]; 10:1-7,22-23, 31-32 [Table of Nations]; 11:10-27,31-32 [Genealogies of Shem, Terah anād Abraham] (*Introduction*, pp.147, 179).

[15]In the Nachträge to the 1889 edition of his *Composition des Hexateuchs* he gives a few pages (305-312) to selected points in early Genesis (in 4, 6, 10 and 14), and though he mentions “Keilforschung”, he refers only to Theodore Nöldeke, a great Semitist but not an Assyriologist. He was evidently aware of the work of George Smith, since in his *Geschichte Israels* he refers to Smith’s book *The Assyrian Eponym Canon* (London, 1875) in connection with the date cited in Exodus 12:2 (p.339 n.1), but takes not other account of his discoveries.

[16]In “The Chaldean Account of the Deluge”, *Transactions of the Society of Biblical Archaeology* 2 (1873), pp.213-234 (essentially the paper read by him before the Society in December 1872, with an English translation of the text as he had it at that point); and “The Eleventh Tablet of the Izdubar Legends. The Chaldean Account of the Deluge”, *Transactions of the Society of Biblical Archaeology* 3 (1874), pp.530-96 (a more substantial paper giving interlinear text, transliteration and translation and brief commentary on the basis of many fragments from Nineveh. [The name Izdubar is now read as Gilgamesh]. The main tablets used by him, K.2552+, K.3375, and K.8517+ (prefixed K indicates Kuyunjik Collection (the “Library of Ashurbanipal”), and + indicates a tablet made up of several joined fragments, listed under the lowest Museum number), are shown in their then state of reconstruction in two photographs, obverse and reverse, taken in the early 1870s at the time when Smith was working on them, reproduced in A.R. George, *The Babylonian Gilgamesh Epic. Introduction, Critical Edition and Cuneiform Texts*, (Oxford, 2003), I, pp.413-414, figs 12-13. An account of Smith’s discovery of

the first tablet fragment, and the meeting at which he read his paper, is given by E.A.W. Budge in *The Rise & Progress of Assyriology* (London, 1925), pp.112-113.

[17]On the Flood story Schrader comments "Concerning the time when the Chaldaean legend (*Sage*) came to the Hebrews, we can only state with certainty that the date cannot fall later than the age of the prophetic-Jahvistic narrator (about 800 B.C.), since he had already codified (*codificirt hat*) the legend." (*Keilinschriften und das Alte Testament* (Giessen, 1882), pp.53-54), in other words, by implication, ruling out a view that the Flood story would have been borrowed by the Hebrews at the time of the Exile. Schrader includes in the volume an *Excurs* by P. Haupt (pp.55-79) giving a transliteration, translation and commentary on the flood story.

[18]Cheyne, *Founders of Old Testament Criticism* (London, 1893), p.235: the full quotation, part of a passage criticising A.H. Sayce, runs "If he [Sayce] had . . . said that some critics needed to be stirred up to a greater zeal for archaeology, -- that Kuenen for instance had not given enough attention to Assyriology, and that Wellhausen and Robertson Smith (like other Semitic scholars) displayed an excessive distrust of that study, I should have had no objection." Cheyne also comments "I fully admit that until Schrader and Sayce arose, Old Testament critics did not pay much attention to Assyriology" (p.234). Cheyne held Sayce in high regard, though disagreeing with him because he had come away from an earlier acceptance of the higher critical position (*Founders of Old Testament Criticism*, pp.231-241). An examination of the changing views of Sayce was given by P.J. Wiseman in *JTVI* 77 (1945), pp.101-111, a paper I summarised in *Faith & Thought* 48 (2010), p.4.

[19]E.B. Pusey (Regius Professor of Hebrew at Oxford, 1828-1882), for instance, travelled to Göttingen in 1826-27 to study oriental languages, particularly Arabic (D. Forrester, *Young Doctor Pusey* (London, 1989), pp.45-46). A hundred years later he would no doubt have studied Akkadian. The same point is clear from the fact that S.R. Driver included a twenty-seven page appendix on "The Arabic as Illustrative of Hebrew" in his standard *Treatise on the Use of the Tenses in Hebrew* (Oxford, 1874).

[20]For the flood texts see W.G. Lambert and A.R. Millard, *Atra-hasis, the Babylonian Story of the Flood* (Oxford, 1969); also bibliography of these and other texts in Kitchen, *Reliability*, pp.591-597 notes 1-47 (relating to pp.423-447); and, more summarily, Waltke, *Genesis*, p.23.

[21]In Paris: J.C.L. Gibson, *Textbook of Syrian Semitic Inscriptions*, 1, *Hebrew and Moabite Inscriptions* (Oxford, 1971), pp.71-83; T.C. Mitchell, *The Bible in the British Museum* (New ed.: London, 2004), no. 21.

[22]Gibson, *Syrian Semitic Inscriptions*, 1, pp.23-24; Mitchell, *Bible in the British Museum*, no. 29.

[23]In Istanbul: Gibson, *Syrian Semitic Inscriptions*, 1, pp.21-23; J. Renz, *Handbuch der Althebräischen Epigraphik*, I (Darmstadt, 1995), pp.178-189.

[24]In 1908, the dating was taken back to the 10th century with the Gezer "Calendar", also now in Istanbul (Gibson, *Syrian Semitic Inscriptions*, 1, pp.1-4).

[25]Conveniently in J. Naveh, *Early History of the Alphabet* (Jerusalem and Leiden, 1982), pp.26-27 with figs 18-20, from Shechem, Gezer and Lachish.

[26]Naveh, *Early History of the Alphabet*, pp.37-40 with figs 32-34, inscribed arrowheads dating from the 12th-11th centuries and compare Mitchell, *Bible in the British Museum*, no.6, alphabet chart columns 3 (11th century arrowhead) with 5 (Moabite stone).

[27]Fohrer, *Introducton*, pp.106-113; also in more detail, Rogerson, *Old Testament Criticism in Nineteenth Century England and Germany* (1984), and E. Nicholson, *The Pentateuch in the*

Twentieth Century. The Legacy of Julius Wellhausen (Oxford, 1998). It is interesting to note that neither Rogerson nor Nicholson makes any mention of such figures as Schrader, Sayce, or George Smith.

[28]For a cautious treatment of different views as far as they concern early Genesis see e.g. G.J. Wenham, *Genesis 1-15* [Word Biblical Commentary] (Dallas, 1987), pp.xxxi-xxxii (on P) xxxiv-xxxv (general).

[29]*The Pentateuch in the Twentieth Century*, p.vi.

[30]See e.g. D. Bebbington, *Patterns in History: A Christian Perspective* (Leicester, 1990), pp.68-91.

[31]Some who believed in progress were aware that human nature has not changed, see e.g. a quotation from David Hume (Bebbington, *Patterns*, pp.77-78), but the assumption of human progress was and is very general.

[32]Geerhardus Vos offers an exposition on the lines of progressive revelation in, *Biblical Theology. Old and New Testaments* (Grand Rapids 1948; London, 1975).

[33]This point is made by Kitchen concerning Wellhausen's knowledge of the background of later elements in the Old Testament (*Reliability*, pp.494-497).

[34]*Genesis* [Bible Student's Commentary] (Grand Rapids, 1981), I, pp.1-42.

[35]See e.g. W.P. Lehman, *Historical Linguistics* (3rd ed.; London, 1992).

[36]This group comprised the Semitic languages together with Egyptian, Berber, Cushitic and others. A good account is given in I.M. Diakonoff, *Afrasian Languages* (Moscow, 1988); see also briefly Lehman, *Historical Linguistics*, p.83.

[37]See e.g. J.P. Mallory and D.Q. Adams, *The Oxford Introduction to Proto-Indo-European and the Proto-Indo-European World* (Oxford, 2006), pp.86-105, 448-449; see also briefly Lehman, *Historical Linguistics*, p.83.

[38]Further evidence of early languages is limited. Other writing systems -- Proto-Elamite and Linear Elamite (post-c.3000 B.C.) and the Indus Valley script (post-c.2500 B.C.), both still awaiting full decipherment -- are later than the Mesopotamian and Egyptian scripts (see on Elamite W. Hinz, *The Lost World of Elam* (London, 1972), pp.28-31; D.T. Potts, *The Archaeology of Elam* (Cambridge, 1999), pp.71-79, 125-126; on the Indus script Mortimer Wheeler, *The Indus Civilization* (Cambridge 1968), pp.107-108, 110-126 (dating); and B. and R. Allchin, *The Rise of Civilization in India and Pakistan* (Cambridge, 1982), pp.212-213, 217-221 (dating)); and the earliest known Chinese writing dates only from the 14th century B.C., though it has a developed form which suggests an origin in about the 17th century. The Chinese language is generally assigned to a larger Sino-Tibetan family, and various other wider groupings have been proposed. One theory would see deep level correspondences between Sino-Tibetan and Indo-European, but this is highly speculative. (on this see A. Peyraube in R.W. Woodard (ed.), *The Cambridge Encyclopaedia of the World's Ancient Languages*, (Cambridge, 2004), pp.988-990 = *The Ancient Languages of Asia and the Americas* [reissue in fascicule form] (Cambridge, 2008), pp.136-138).

[39]The principal argument for placing the Exodus in the 13th century is the text on the Merneptah Stela, on which see Mitchell, *Bible in the British Museum*, no.14. Others argue for the 14th century, but this would not greatly affect the argument.

Darwin – bane or blessing?

Chris Knight

I bought my first copy of Darwin's *The Origin of Species* [1] on a school trip. The battered green-bound 6th edition dating from the turn of the twentieth century was being sold off by a Christian community in a purge of their library. It took me over a decade to get round to reading it. By the time I did read it, the old green *Origin* had been joined on the shelf by modern paperback versions of both the first and sixth editions and I was well on the way towards a career in academic biology.

This use of *Origin* probably says something about my reading habits, but it also says something about biology. I felt I could stake a claim to be an aspiring biologist simply by having (and displaying) a copy of Darwin's great work. That 'Darwin' was a shorthand for a whole scientific culture, a set of allegiances and beliefs about how to understand the universe we find ourselves in. I had as yet only touched the hem of that science and its culture, but the book was a statement of intent.

My student desire to have Darwin in pride of place on my shelf then is not perhaps so distant from the desire in some quarters of the Christian Church to give him pride of place in the armies of the anti-Christ. Those who wield a bearded image of Charles Darwin as an icon of all they despise about the secular world in general, and modern science in particular, have traditionally been subscribers to Creationism. That term is itself a shorthand for various sets of beliefs about the origin of the universe, lying somewhere between the a-scientific and the anti-scientific. The baton has now been taken on by the 'Intelligent Design' (ID) movement, a, more or less subtly, different set of beliefs with a similar relation to science [2]. And when evolutionary biology is referred to in ID, it is Darwin (and his '-ism') who is invoked as a shorthand (e.g. in ID-related book-titles such as. "*Darwin's black box*", "*Doubts About Darwin*" and "*Debating Design: From Darwin to DNA*" [3]).

So here is the first, most obvious, manifestation of Darwin as bane or blessing: a bane to certain sections of Christianity (and indeed other religious traditions, for instance see Seyyed Hossein Nasr's essay on 'Science and Islam' [4]) and a blessing to biologists. There are occasions when one might equally well invert the relationship: Darwin as a blessing to those anti-scientifically inclined sections of the Church who might never have found a public voice without Darwin as a rallying point; and Darwin as bane to evolutionary biologists whose forays in the popular media are associated *a priori*, not with the excitement of new discoveries about the way the universe works, but with a sterile slanging match over someone who died nearly 130 years ago. There are elements of reality in all these assignments. What they share is that they concern only Darwin the icon; none depends directly on Darwin the person, scientist or writer, let alone particular merits of his science or writing. The most straightforward answer to this

essay's title might therefore be to cry 'A plague o' both your houses!' to scientific and religious standard-bearers alike: Anything or anyone who, like Darwin, is primarily used as an icon rather than engaged with in addressing real issues, be they scientific, religious or in any other sphere, can ultimately only be a bane to the progress of human understanding; with perhaps the only exception of providing interesting material for anthropologists and social scientists.

In such a view Darwin could best be done away with. Certainly the idea that life evolves long predates Darwin. Without him, Wallace's findings in South-East Asia would nonetheless have started to bring the process of natural selection to scientific notice at a similar point in history. The real breakthroughs of the neo-Darwinian synthesis, bringing together evolution and genetics, could still have happened and we might have avoided all the obfuscatory fuss over Darwin. Perhaps, in this view, there was something 'wrong' with Darwin—publishing such a weighty tome in *Origin* was too confrontational a way of doing science [5]. Perhaps he was too good a scientific interpreter—through *Origin* the wider public has been enabled to believe it understands evolution by natural selection in a way we have never felt we understand other parts of science. Had we not had Darwin to interpret it we might have been left in a similar level of ignorance about evolution to that, for instance, associated with most of physics. Then, in such a case it might have been down to writers on science and faith to glory in the way that randomness, random chance and contingency, apparently arbitrary phenomena, have given rise to humans in the process of evolution by natural selection as they now do in physics for Heisenberg's uncertainty principle or the apparent 'fine tuning' of the fundamental constants of the universe [6].

However, such a Darwin-free 'utopia' is unrealistic. Dismissing him simply for becoming a divisive icon is not only grossly unfair to Darwin, it ignores the possibility that Darwin's becoming such an icon might be a symptom of the divisive issues his science raises rather than a cause. We have an emotional reaction to 'nature Nature red in tooth and claw' not merely because the metaphor Tennyson's phrase is a striking one, but because the processes of nature it refers to are something to which we can relate much more closely than, for instance, similarly fundamental processes in geology or quantum physics. Indeed the popular appeal of ideas of evolution in the natural world (particularly as set out in *Vestiges of the Natural History of Creation* in 1844) undoubtedly contributed to Tennyson's choice of this subject in a poem exploring human grief and loss from which the quote comes [7]. It therefore seems unreasonable to dismiss Darwin simply for becoming prominent in an inherently inflammatory area of science. The 'bane' that Darwin the icon might be is really only the bane that some religious groups see in evolutionary biology or that Richard Dawkins sees in religion or that many of the rest of us see in the fruitless argument between the two. If then we are to classify Darwin as bane or blessing, we need to set the icon aside and engage with him more directly.

When engaged with more directly, for instance by reading *Origin*, the different users of Darwin the icon find different things. It seems likely that, to those creationists or ID followers who get as far as reading *Origin*, it must be something of a let-down. Contrary to the experience of reading Dawkins, there is no polemic to get one's teeth into. Despite *Origin* being 'one long argument' [8], that argument is not like Job's, an argument with God, to be answered by the wonder of the Behemoth [9] (or bombardier beetle, bacterial flagellum, or any other claimed 'irreducible complexity' [10]). Rather, Darwin's argument is with his observations, with the scientific community of his time and with himself.

Perhaps then, engaging with *Origin* shows it to be a piece of its time. That could leave Darwin is neither bane nor blessing. It could be that, looking beyond the icon, he is irrelevant to modern science and modern anti-science alike. The fact that this is not true is what bowled me over when I did eventually take my iconic *Origin* down from the shelf to read it. I, along with much of the modern world, am steeped in a scientific universe of molecules and genetics. Darwin knew nothing of either [11]. Yet Darwin's thoughts on such commonplaces as domestic pigeons hold a depth and continuing relevance that I for one had not expected. He was encumbered by an inadequate fossil record and an inadequate theory of inheritance. He made up for it by careful thought and a dogged accumulation of evidence. We today have a robust theory of inheritance instantiated in mind-boggling molecular detail. We have also accumulated vastly more data on the history of contemporary organisms, bacteria in particular, in the genome sequences of thousands of species. These genomes attest to the tree-like history of life with new biological taxa originating from common ancestors just as Darwin envisaged [12]. Similarly Darwin's process of natural selection has been reinforced and renewed by modern science. Compared to Darwin's day we now have both have vastly more mathematically robust theory, in the form of population genetics, and vastly more evidence from different quarters, not least experimental evolution. [13].

Importantly this more robust theory and data allow modern evolutionary biologists to probe the limits of evolution as Darwin envisaged it, discovering where it breaks down. For instance the tree-like structure of life breaks down in the cases of one organism engulfing another, a crucial process in evolution since it resulted in mitochondria, the engine of all our cells and chloroplasts the solar power plants of all plant cells [14]. Similarly, neutral theory now provides a robust framework against which to test for identify natural selection as a cause for evolutionary change. But while modern scientists have all these advantages over Darwin in terms of data and mathematically grounded theory, what we frequently lack is the depth of thought he achieved. In *Origin*, that depth was obtained at least in part through the length of time between observations and publication—decades spent honing thought and intuition, an approach not available to those who earn their living from science today. It is therefore not surprising that, whenever tackling a new area, biologists are well advised to check what

Darwin had to say about it first [15].

But even if *Origin* and others of Darwin's writings can be an inspiration and a blessing to modern science, perhaps the rest of humanity, and faith communities in particular, should respectfully leave Darwin and his works on one side as an author of his time and no longer relevant. This seemed to be the message when I bought that first copy of *Origin*. From the same table I also bought a copy of the Book of Common Prayer (1662) and a King James translation of the bible (1611), each bearing a stern admonition not to remove them from the chapel. The Franciscan community who was selling them undoubtedly meant no disrespect to these venerable tomes, making use of both the bible and liturgy several times a day, but they had clearly moved on to more recent texts and had no continuing need for such historic artefacts. The implication was that *Origin* was surplus to requirements for the same reasons.

I did not discover whether the 'biology' shelf of their library was thereafter empty. But if not literally true, it is certainly the case that for many faith communities there is no interface with the science of biology. So while not being directly allied with creationism or ID, science in general and evolutionary biology in particular has been laid on one side as not relevant to faith. One might imagine advantages to such an approach. It avoids what could undoubtedly be a distraction from the rightful concerns of the faithful. The popular level of discussion sees little beyond a dichotomy between, on the one hand Darwin, whose most vocal proponent is also the author of 'The God Delusion' [16] and on the other ID which, while perhaps trying to distance itself from obvious reality-denial of young-earth creationism, nonetheless enjoys no support among relevant scientists, who otherwise seem to have a reasonable grasp of physical, if not spiritual, reality [2]. Engaging with Darwin would seem to imply positioning oneself in one camp or the other, an action which itself would split many faith communities, and having done so, neither camp seems particularly attractive to those wishing both to be true to their faith and to engage with the reality in which they find themselves. Even for those who might see beyond the dichotomy, there is little motivation to push the point, given that doing so would rile those with a more limited view and the advantages of a more constructive engagement with evolutionary biology are unclear.

Such a laying aside of evolutionary biology could leave a space where Darwin is neither bane nor blessing to people of faith. It is however an uneasy space, the bile of the Dawkins vs. ID altercation being fought over Darwin questions whether he can be put on one side with any true respect. Beyond that, there is a problem in the science: one of the things Darwin the icon stands for is evolution itself and, as the great geneticist Theodosius Dobzhansky put so succinctly, "Nothing makes sense in biology except in the light of evolution" [17]. In other words, if we put aside what Darwin stands for, we lose our ability to engage with the whole gamut of biological science. This is a problem since, although the direct relevance of evolutionary biology to faith is not obvious to

many, the relevance of other areas of biology increasingly is. So, for instance, in a world of human-induced climate change, the resulting crisis for creation is increasingly being seen as an issue with which people of faith need to engage, and the relevant science here is biology. Thus, for instance, the Christian conservation organization A Rocha makes science a priority. This prioritization is necessary for it to do its work: without a credible scientific basis for its actions it cannot put effective arguments to the secular organizations with which it deals to make conserving its care of creation a reality [18]. But more than being a necessity, the process of ecological science, for this organisation and many scientists beyond it, is a process of understanding God's creation, the second of 'God's two books' and therefore a spiritual exercisedevotional act in itself [19]. Why is evolution relevant to such ecology? In academic science, ecology is very closely allied to evolution, with many joint departments. This perhaps reflects the basisrooting of both in the population genetics begun in the 1930s, a body of theory that considers the change in frequency of particular versions of genes in populations (which is the definition of evolution) in terms of the interactions between different organisms and between organisms and their environments (which is ecology). More generally, ecology attempts to understand the interactions of organisms in real environments, which is precisely what Darwin points to when he imagines a 'tangled bank' and sets this as the result of the evolutionary 'laws' he presents [20]. More pragmatically, evolutionary biology may also be the only hope for achieving a generally acceptable measure of the biodiversity threatened by climate change. Conservation efforts need to be prioritised. Agreeing how many, how diverse and how unusual species are in any particular area provides the grounds for that prioritisation. The empirical degree of evolutionary divergence among those species, and between them and those in other areas, is necessarily an important part in this [21].

Faith communities have had longer-standing connections with biology in the ethics of human reproductive biology, which undoubtedly requires evolution to make sense of, not least in view of the claims that changes in human reproductive patterns are leading to 'the end of evolution' [22]. My own Christian denomination, Anglicanism, seems currently to be tearing itself apart over the ethics of homosexuality, a biological subject. The biology of any 'gay genes' putative genes affecting sexual orientation certainly needs to be made sense of primarily 'in the light of evolution', given the fact that gay people would with different sexual orientations might be expected to leave fewer different numbers of offspring than heterosexuals [23].

It is therefore problematic for faith communities to try to leave evolutionary biology on one side. If evolutionary biology cannot be avoided, then perhaps Darwin the icon needs, not so much to be put aside, as moved beyond. How might one move beyond the bane of the icon— hero or anti-Christ, but largely unhelpful to the world beyond academic evolutionary biology?? I suggest that the first step in doing so is to ask if there are ways in which Darwin, on his own terms, can be a blessing beyond a limited

scientific community. I will make only a couple of speculative suggestions for what such ways might be, based on the discussion so far:

Firstly, Darwin might be a blessing beyond the scientific community in the way that he was a brilliant communicator and has spawned a line of brilliant communicators in this key area of science [24]. *Origin* is infinitely more readable than similarly transformative scientific works such as Newton's *Philosophiæ Naturalis Principia Mathematica*. Part of that has to do with the closeness to home of his subject matter (as discussed above), but that by no means covers it. Subsequent seminal works in the same field, such as Fisher's *The Genetical Theory of Natural Selection* (1930) have been much less accessible. There is a direct connection from Darwin's readable science to the readable scientists of the 20th and 21st centuries. Whatever one makes of what they communicate, Stephen Jay Gould, Richard Dawkins, Steve Jones and a host of lesser-known authors are brilliant communicators in a tradition that can be traced directly to Darwin. Science is deeply tied up with the development of the modern world, its successes and its crises. Darwin's legacy of commitment to effective communication of some of that science can surely only be a net blessing.

The down-side of this communicative tradition, as noted above, can be a rather unhelpful confrontation between science and faith, of which the axis between Dawkins and ID is the most relevant here. As observed above, neither extreme, nor anything on a line between them, is particularly palatable to many, particularly those belonging to faith communities. My second suggestion for how Darwin might be a blessing outside science is therefore as a counter to the Dawkins-ID axis. Darwin and his works point in a direction orthogonal to the axis that uses science as a tool for speculation as to the presence or absence of a creator. Darwin attests to understanding creation on its own terms, via acute observation, the accumulation of data and, only after that, careful reasoning. This also puts his works orthogonal to the works of William Paley— whose argument from design effectively remains the Dawkins-ID axis. Darwin himself certainly admired William Paley's arguments [25], but his own works use a completely converse approach. Where Paley starts with a hypothetical world ('IN crossing a heath, suppose I pitched my foot against a *stone*' [26]), Darwin starts with the concrete physical world ('When on board H.M.S. 'Beagle,' as naturalist, I was much struck with certain facts' [27]) and only after decades of observation and accumulation of such 'facts' culminates in the argument of *Origin*. If people in general and people of faith in particular want (or, as I've argued above, need) to engage with evolutionary biology, Darwin, offers a paradigm for engagement with that science that is very separate and distinct from the 'Paley-esque' line between Dawkins and ID and therefore much more acceptable to those wishing to be true to both their faith and the physical reality in which we find ourselves.

There are undoubtedly other ways in which Darwin might be or become a blessing

outside a narrow scientific community. However, it suffices here to observe that the possibility is there. Darwin, when limited to being an icon for evolutionary biology, is frequently a bane. It may be possible, in principle at least, to prise apart Darwin the historical figure from the multifarious issues evolutionary biology raises about our place in the universe, and set him aside with respect, both as an unnecessarily divisive icon and a scientist of his time. However, I have argued here that those issues raised by evolutionary biology cannot so easily be put aside. With or without Darwin, the science cuts sufficiently close to our experience that it will necessarily connect with lives well beyond academia. Evolutionary biology is also sufficiently pervasive that it would not be desirable to put it on one side even if we could. The vitriolic scientism of Richard Dawkins and the antinon-science of ID are two manifestations of the wider force of this science. It seems hard to classify either of those as anything but a bane either to science or the world beyond. In that context, can Darwin himself be a blessing, beyond being a less antagonistic cipher for evolution and evolutionary biology than Dawkins (a role he has performed effectively in many of 2009's anniversary celebrations)? I have argued that he can. To contemporary science he remains a blessing through a collection of deeply insightful works which continue to inspire, guide and spark ideas. Beyond science he has the potential to be a blessing both as a paramount communicator of science whose legacy continues into the present and as an antidote to the more baneful collisions between evolutionary science and the world beyond. I therefore live in hope that the Christians' library that blessed me by selling me my first copy of *Origin* continues to bless its readers with less battered volumes both by Darwin and his successors in evolutionary biology.

Footnotes

- [1] *The origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*. Darwin C., London: John Murray. 6th ed., with additions and corrections (1876). The title of earlier editions started with 'On' and by the time of my impression the initial definite article had also been dropped from the cover and spine. It will hereafter be referred to simply as *Origin*. The full text of all major editions of *Origin*, all of Darwin's other extant writings plus an array of Darwin-related works (including Paley's *Natural Theology*) may be found at <http://darwin-online.org.uk>
- [2] The Intelligent Design (ID) movement claims (e.g. according to the ID think-tank, the Discovery Institute <http://tinyurl.com/y89aodw> accessed 24/0106/09/10), that ID is a "[theory] that certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection". This is not the place for a discussion of ID itself. A thorough and readable but disinterested (legal) treatment of ID's relationships to both science and creationism can be found in the 2005 decision on the American school board case *Kitzmiller v. Dover area school*

district et al. available from <http://is.gd/6X3le> It concludes: "In making this determination, we have addressed the seminal question of whether ID is science. We have concluded that it is not, and moreover that ID cannot uncouple itself from its creationist, and thus religious, antecedents."

- [3] *Darwin's Black Box: The Biochemical Challenge to Evolution*, Michael J. Behe, Free Press: New York (1996); *Doubts About Darwin: A History of Intelligent Design*, Thomas Woodward, Baker books (2003); *Debating Design: From Darwin to DNA*, Cambridge University (2007) Press, William A. Dembski & Michael Ruse (Eds.).
- [4] *The Oxford Handbook of Religion and Science* P. Clayton (Ed) and Simpson (As. Ed.) (2006).
- [5] The definite article in *Origin's* title (missing as noted in [1] from the cover of my late edition) could also be seen as unnecessarily confrontational. What Darwin deals with is the origination of novel species, and doesn't touch on *The origin of the first species or life itself*. The origin of life is today a separate and surprisingly productive area of research biology.
- [6] John Polkinghorne in particular clearly sets out the modern natural theology of 'fine-tuning' arguments from physics. For a recent brief summary, see J. Polkinghorne *Christianity and Science* in *The Oxford Handbook of Religion and Science* P. Clayton (Ed) and Simpson (As. Ed.) (2006).
- [7] In Memoriam A.H.H. 1849, 'Nature red in tooth and claw' appears in canto 56 which concerns the difficulty of reconciling the idea of a loving God with a natural world where whole species go extinct, issues now confounded with Christian concerns over the process of natural selection that Darwin outlined in *Origin* a decade later.
- [8] The final chapter of *Origin* opens with 'As this whole volume is one long argument...', referred back to in his autobiography: 'Some of my critics have said, "Oh, he is a good observer, but has no power of reasoning." I do not think that this can be true, for the *Origin of Species* is one long argument from the beginning to the end, & it has convinced not a few able men.' Darwin, Francis ed. 1887. *The life and letters of Charles Darwin, including an autobiographical chapter*. London: John Murray. Volume 1 p103.
- [9] "[Then Job answered:] But I would speak to the Almighty, and I desire to argue my case with God... Then the Lord answered Job out of the whirlwind:... 'Look at Behemoth, which I made just as I made you' " Job 13.3 and 40:6,15a NRSV translation, anglicized edition (1989).
- [10] A term credited to Michael Behe, a key figure in the 'Intelligent Design' movement, to mean (biological) features unreachable by evolutionary routes. It is a re-invention of a pre-existing concept of irreducible complexity.

- meaning features that emerge specifically from complex systems, which can and do evolve like anything else.
- [11] For a discussion of the extent to which Darwin's ideas stand up in the light of modern genetics and molecular biology see Charlesworth, B. and D. Charlesworth, *Darwin and genetics*. Genetics, 2009. **183**(3): p. 757-66.
- [12] With the recent Darwin anniversaries, Darwin's notebook sketch from 1837 with its 'I think' annotation has received much coverage <http://tinyurl.com/6hs5uv> particularly given its striking similarity to modern phylogenies of life derived primarily from DNA sequences. However a tree-like vision for the origin of species goes back further, at least to an obscure diagram by Augier (1801) and Lamarck's 1809 book *Philosophie Zoologique* p 463 <http://tinyurl.com/knt7vr>, though Pallas in 1766 used the analogy: "the system of organic bodies is best of all represented by an image of a tree" quoted in Archibald, J.D., *Edward Hitchcock's pre-Darwinian (1840) "tree of life"*. J Hist Biol, 2009. **42**(3): p. 561-92 see also Stevens, P.F., *Augustin Augier's "Arbre Botanique" (1801), a Remarkable Early Botanical Representation of the Natural System*. Taxon, 1983. **32**(2): p. 203-211. I am indebted to the Evoldir list (<http://evol.mcmaster.ca/evoldir.html>), in particular Joel Parker, and Peter Gogarten for highlighting these references.
- [13] For a recent review see Buckling, A., et al., *The Beagle in a bottle*. Nature, 2009. **457**(7231): p. 824-9.
- [14] Recent work suggests that such 'endosymbiosis' events may have profoundly influenced even more of contemporary life than previously thought, see Lake, J.A., *Evidence for an early prokaryotic endosymbiosis*. Nature, 2009. **460**(7258): p. 967-71.
- [15] I most recently encountered this advice from Deborah Charlesworth, one of the UK's leading population geneticists, in her Fisher memorial lecture 2010: 'Fisher and Modern Evolutionary Genetics' see (<http://tinyurl.com/27ssa6t>) In fact she almost took the consultation of Darwin as a given, her point being that in addition, the less accessible work of Ronald Fisher should be consulted.
- [16] Dawkins, R., *The God Delusion*. 2006: Bantam Books.
- [17] A very similar phrase is best known as the title of an essay: Dobzhansky, T., *Nothing in Biology Makes Sense Except in the Light of Evolution* American Biology Teacher 1973. **35**: p. 125-129. though this quote comes from an earlier piece trying to reconcile the then new science of molecular biology with more traditional biology: Dobzhansky, T., *Biology, molecular and organismic*. American Zoologist, 1964. **4**: p. 443-452.
- [18] This practical role for research amounts to much more than pragmatism, as illustrated by Will Simonson's article on the A Rocha website: "The science is important because it is all too easy for well-intentioned intervention to

wreak damage to a natural environment by lack of ecological understanding. Science helps create that understanding, and becomes an important tool for the biblical mandate to care for God's world." www.arocha.org, under Research: our approach, accessed 17/01/10. <http://tinyurl.com/24vy2br> , accessed 06/09/10.

- [19] While the idea of God speaking through the 'book of nature' as read by science dates back at least to Galileo's use of the metaphor, the ideas of such natural theology peaked around the time of Darwin, notably with William Paley (see [2425-26] below).
- [20] The final paragraph of *Origin* begins "It is interesting to contemplate a tangled bank, clothed with plants of many kinds, with birds singing on the bushes, with various insects flitting about and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent upon each other in so complex a manner, have all been produced by laws acting around us"
- [21] This interface between the degree of evolutionary divergence and the cataloguing diversity is currently inhabited by the DNA bar-coding movement that uses short, evolutionarily informative DNA sequences to identify species. See <http://barcoding.si.edu/history.html> See <http://barcoding.si.edu/history.html>
- [22] Steve Jones, head of genetics at University College London, is particularly associated with this view, he has long held that various factors "seem to be conspiring to slow down human evolution," (<http://is.gd/6xGbj>) though there was a recent flurry of press interest in the subject, e.g. <http://is.gd/6x1qy> (Times, 7th October 2008).
- [23] See <http://is.gd/6xCvf> for a sophisticated, if speculative, discussion from the popular press of the possible evolutionary biology of 'gay genes' (Sunday Times 24th August 2003).
- [24] The ISI database of scientific journals lists only 0.6% (39 out of 6620) under 'Evolutionary Biology', but over 7 times that proportion of 'popular science' books in Amazon.com have 'evolution' as a keyword (3,154 out of 74,089 in January 2009).
- [25] "The logic of this book [Paley's 'Evidences of Christianity'] and, as I may add, of his 'Natural Theology,' gave me as much delight" Darwin, Francis ed. 1887. *The life and letters of Charles Darwin, including an autobiographical chapter*. London: John Murray. Volume 1 p47
- [26] The opening words of Paley, W. 1809. *Natural Theology: or, Evidences of the Existence and Attributes of the Deity*. 12th edition London: Printed for J. Faulder. p1
- [27] The opening words of *Origin*, see [1]

Another Look at Mature Creation

P.G. Nelson

One of the ways of seeking to reconcile Genesis and modern science employs the idea that God created the universe in a mature state.[1] This idea has a long history – it was suggested in the early 19th century by Chateaubriand,[2] developed by Penn.[3] and promoted famously by Gosse.[4] It has not, however, been generally accepted. Here I develop the idea, and address criticisms of it.

Theory

The basic idea is very simple. According to Genesis, God created the universe in six days a few thousand years ago. At the end of the sixth day, it was a going concern. It accordingly appeared to have a history that it did not in reality have – trees had rings, pebbles were smooth, stars shone, and so on.

A complication is that, after the Fall, God changed the natural order to some extent. He condemned the Snake to live on its belly, Eve to a difficult life, and Adam to toil and death (3:14–19). He told Adam, ‘Cursed is the ground because of you’, and explained that it would now produce thorns and thistles.

If these statements are taken literally (which the theory allows us to do), they imply that God modified the design of the universe after the Fall (cf. Rom. 8:20–22[5]). If he carried this through consistently, so that all parts of the universe conformed to the new design, then, after the Curse, the universe would again have been a going concern, and would again have appeared to have a history that it did not in reality have. This history would necessarily have been different from the one that it appeared to have before the Fall.

The last point can be illustrated by what happened when Jesus turned water into wine (John 2:1–11). Before the miracle, the water had a certain history. When he changed it into wine, what it became appeared to have a quite different history.

Modern science studies the post-Fall universe. It explores the design of this universe, and traces its history on the assumption that it always had this design. This history is real back to the Curse, but before this, it is virtual.

Formal treatment

We can express all this formally as follows. Suppose that the original universe was a completely determined dynamical system, such that its state at noon on one day could be predicted, in principle, from its state at noon on the previous day. Suppose further that it comprised a large number of elementary components interacting and moving

according to fixed laws. Then its state, as represented by the positions and motions of the components, can be expressed as a continuous function of time, $f(t)$, where $t = 0$ is the time of creation. Now since f is a continuous function, states can be calculated from f for $t < 0$. Thus, when, at $t = 0$, the system was created, it inevitably appeared to have a previous history. Not even God could create it without it having this appearance. The only exception is if f has a singularity at $t = 0$, as on the big bang model.

This analysis applies to any determined dynamical system. A simple example is a pendulum. When a pendulum is made and set in motion, it immediately appears to have been in motion before this. There is nothing its maker can do to prevent this, short of attaching a label stating the time when he or she set the pendulum going.

For a second example, consider two identical spring-driven clocks. One is wound up and started. After it has been running for some time, the second is given the same number of turns as are left on the first clock, and set running. The two clocks cannot now be distinguished. To anyone who has not witnessed the history of the second clock, it looks as if it has been running for as long as the first.

The effect of the Curse is to modify the function f to f' . The function f applies from $t = 0$ to $t = t'$, the time of the Curse, and the function f' from $t = t'$ onwards. States calculated from f' for $t < t'$ are virtual.

This can again be exemplified by a pendulum. A pendulum that has its amplitude changed at $t = t'$ will appear to have had a different history before t' than it actually had. The same applies to a clock that has its hands adjusted.

If the universe is not a completely determined system (as Bohr understood the quantum theory to imply, but Einstein resisted), the picture is more complicated. Such a system can have more than one possible history. Consider, for example, a uranium mineral. This can have an infinite number of possible histories, depending on which atoms have disintegrated, and when. (For many such systems, however, there is still only one macroscopic history. A uranium mineral, for example, has a history in which isotopic atoms, collectively, have disintegrated at a constant rate.)

Details

Extent of the Curse

Scholars differ widely over the nature and extent of the Curse. I take the Bible to imply that God made radical changes to the natural order at this point.[6] According to Genesis, the creation, before the Curse, was 'very good' (1:31). After the Curse, Biblical writers rate many things in nature as not being 'very good'. These include predation (Isa. 11:1–9 etc.), [7] disease (Mat. 4:23–24 etc.), and natural disasters (Mat. 24:7 etc.). The list may also include the death of higher animals (cf. Jon. 4:11 etc.).

Jesus made it clear that some evils in the world have a general origin (Luke 13:4–5, John 9:1–3a). I take this to be the Curse. In Genesis, predation certainly begins after this (6:11–12, cf. 1:29–30), and in Revelation, disease ends when ‘there will no longer be any curse’ (Rev. 22:2–3).

Starlight

Starlight poses a well-known problem. If God created the universe a few thousand years ago, why is it possible to see stars that are more than a few thousand light years away? The light from such stars will not yet have had time to reach the earth.

Mature creationists answer this by saying that, when God created the stars, he also created the light emanating from them. This idea is not as contrived as it may seem. A mature creation is a mature creation. From a scientific point of view, the universe is a complex whole, with an event in one region affecting behaviour in another. Recent calculations have shown that the universe is an extremely sensitive system in this respect: even a very small event can have a significant effect, even at a great distance from it. [8] Thus, for any part of the universe to be created in a particular state, every other part has to be created in accordance with this state.

Radioactivity

Similar considerations apply to radioactive substances. If God created other components of the universe in a mature state, then he also created these in a mature (i.e. partly decayed) state. Maturity of creation means maturity of everything in it. If Adam had been capable of carrying out radiometric measurements, he would have concluded that the rocks around him were older than they were, just as he would have concluded that other things around him (pebbles, trees, etc.) were older than they were.

I am assuming here that radioactivity formed part of the original creation, and not of the ‘corruption’ God introduced at the Fall (Rom. 8:21). If he did introduce radioactivity at the Fall, then he changed the physics of the whole universe at this point from one in which there was no radioactivity to one in which there is.

Genes

According to the theory of evolution, plants and animals on the earth today developed from simple organisms by a mechanism involving mutations and natural selection. According to the theory, therefore, the genes of today’s plants and animals are related to those of simple organisms living in the past, and a history can be constructed from them.

This again is not a problem. If the proposed mechanism is correct, not only for small changes but for big ones, [9] then if God created the natural order in a mature state and cursed it, he gave plants and animals the genes that, after any modifications at the Curse, species would have had if they had evolved in the way the theory describes.

Fossils

Some scholars explain the existence of fossils by invoking the Flood. This is problematic, as I have discussed elsewhere.[10]

On the theory of mature creation, God created the earth with some fossils in it, and incorporated further fossils after the Fall. The details of this depend on the precise relation between the original creation and the natural order after the Fall. To focus the discussion, I shall suppose that lower animals died before the Fall and higher animals after it (other possible cases can be treated similarly). If lower animals died before the Fall, the original creation would have contained fossils of these and of plants. God then incorporated fossils of higher animals after the Fall, along with marks of disease and predation.

This raises a number of questions. First, why should God create the earth with fossils in it? Are they not unnecessary? The answer to this is, once again, that, if the earth is to conform to a particular design, all the features of that design must be present. If the original design was such that, had the earth been in existence for many thousands of years, fossils would have been formed in it, then, when the earth was created, it had to have fossils in it. Otherwise, it would have failed to conform fully with the design.

Secondly, why should God add fossils after the Fall. Why not leave the rocks as the are? The answer is the same. If God changed the design of the earth into one in which higher animals die, then, to make the earth conform completely to this design, he had to remodel, not only the animals living at the time, but also the rocks. Otherwise, the biosphere would have conformed to one design and the lithosphere to another.

A final question is, why should there be fossils of species that, if the earth is only a few thousand years old, never actually existed (e.g. trilobites and dinosaurs)? The answer again is the same. If the present design of the biosphere is such that, had the earth been in existence for thousands of years, species that are not living on earth today would have existed for a while and then died out, then, to make the earth consistent with this design, God had to include, when he created and cursed it, fossils of these species. (This circumstance would arise on an evolutionary design, but does not exclude other ones.)

My explanation of fossils may be illustrated as follows. Imagine a film-director making a science-fiction film about the discovery of an alien settlement in a remote part of the world and the war that this precipitates. His first idea is that the aliens should be

immortal (plot 1), and he writes the script, builds the set, and starts filming on this basis. He then decides to make the aliens mortal (plot 2), so he rewrites the script, adds to the set a cemetery, and starts filming again. The cemetery contains the remains of aliens who lived and died *before* the film begins, but their inclusion is necessary if the film is to accord completely with plot 2.

Any change to a system that is carried through consistently will produce artefacts of that change. This is illustrated by the Second Coming. According to Paul, when Jesus comes again, believers who have died will be raised, while those who are living on earth at the time will be changed, 'in a moment', into the same state (1 Thes. 4:13–18, 1 Cor. 15:35–57). The latter will accordingly appear as if they have died and been raised like the former, even though they will not have done. This is the inevitable consequence of carrying the transformation of believers through consistently.

Adam and Eve

According to Genesis, God created the first pair of human beings (1:26–27; 2:7, 21–23).[11] They and their descendants lived around Eden until after the Flood (Chapters 10–11). As calculated by Driver,[12] the genealogies in Chapters 5 and 11, if complete, give the date of Creation as 4157, 4243, or 5328 BC, and the date of the Flood as 2501, 2936, or 3066 BC, according to the version (Hebrew, Samaritan, or Greek respectively).

Now I have shown elsewhere that Eden was on the Turkish-Iranian plateau north of Mesopotamia, and that the Flood probably took place in this region in about 8000 or 7000 BC.[13] This implies that the genealogies are incomplete, and that Creation took place well before the above dates.

Most anthropologists currently consider that modern humans evolved around 150,000 years ago in Africa and later dispersed around the earth.[14] They arrive at this conclusion along two lines. One depends on the identification of fossils as being of modern humans and the dating of these. The other entails the reconstruction of the historical origins of genetic variations among contemporary humans and gauging mutation rates. Both approaches involve considerable uncertainties. Mutation rates, for example, may vary with time and place.

If anthropologists are right that modern humans dispersed from Africa, this does not necessarily mean that they originated in Africa. They could have originated in the Middle East, migrated to Africa, and then dispersed.

If anthropologists are correct with their dating, Genesis conflates the early history of the human race. Adam and Eve lived in Eden around 150,000 years ago. Their descendents moved to Africa, and then dispersed around the earth. Some stayed on in

Eden and developed farming there. This is the population that, in about 8000 or 7000 BC, God condemned in the Flood.

The timescale would be shorter if mutation rates were higher, and if the oldest fossils assigned to modern humans were dated later, or assigned to an earlier species. A long timescale, however, accords with the comment of an early Armenian scholar on the genealogy in Genesis 5: 'Some used to say that there were innumerable aeons from Adam to Noah'.[15]

According to Genesis, God created Adam from 'dust from the ground' (2:7) and Eve from one of his ribs (2:21–23). He did not evolve them. He did, however, make them to fit in with his design for the rest of the biosphere, both before and after the Curse (1:29–30, 9:1–3). This ties in with my discussion of genes.

Anthropologists identify other *Homo* species. They date most of these before 150,000 BP, but consider some to have overlapped with modern humans. If again they are right, this means that God created the earth with the overlapping *Homo* species on it,[16] and the whole biosphere to a design that, if he had created it earlier, it would have had other *Homo* species living on it. He accordingly incorporated remains of the latter in the rocks, for consistency, as he did for other animals.

Further developments in anthropology could change some of the details in this section.

Discussion

The most common criticism of the idea of a mature creation is that it makes God dishonest. To us, the universe looks old. If, in reality, it is young, and God created it to look old, is he not deceiving us?

The answer to this criticism is that it is impossible, even for God, to create a young dynamical universe without the appearance of age. We have already seen that, for a dynamical system, the function that represents states for $t > 0$ automatically gives states for $t < 0$. Not even God can prevent this, except at a singularity.

'But,' we may say, 'when we see fossils, we naturally think that they are of animals that once lived. If, in reality, God created them as fossils, is he not deceiving us?'

The answer is the same. If God wants the universe to be one in which fossils are formed, then he cannot make a young universe that does not contain fossils. The function that produces fossils for $t > 0$ or $t > t'$ will produce fossils for $t < 0$ or $t < t'$. If he created the universe without fossils, it would be a different universe – a universe that did not produce fossils.

The late Donald MacKay argued along similar lines in answer to Gosse's critic, Charles Kingsley:[17]

... whatever the peculiarities of Gosse's view, the point apparently missed by Kingsley is that some kind of inferable past is inevitably implicit in any ongoing system, whether with fossils or without, so that to speak of falsehood here is to suggest a non-existent option. ... If the Creator in the Genesis narrative were supposed to have made the rocks without fossils, this would not have helped, for nothing could have prevented the rocks from having some physically inferable past: their past simply would have been different and moreover inconsistent with the rest of the created natural history. On Kingsley's argument, pressed to its logical conclusion, God ought not to have created any matter at all, since even molecules cannot help having some inferable past history!

Other arguments against the idea of a mature creation are: (1) that we could equally well say that the universe was created last Thursday;[18] and (2) since the idea cannot be tested, it is useless.[19] The answer to (1) is that God has *told* us when he created the universe – in Genesis. The answer to (2) is that the usual scientific assumption, that the universe has been in existence for as long as it appears to have been, is equally untestable. As a correspondent to *Nature* observed, if God could have created the universe with the appearance of age, 'then science would also appear to be a religion: we simply believe there was no relatively recent Creation but cannot prove it.'[20] Interestingly, the late quantum physicist John Bell entertained the idea of apparent age, citing Chateaubriand and Gosse.[21]

Mature creation is not the only way of reconciling Genesis and modern science, [22] but it has the merit of being logical, and keeping close to the Genesis text. It also exposes the presuppositions of scientific history for what they are. [23]

[1]P.G. Nelson, *Big Bang, Small Voice: Reconciling Genesis and Modern Science* (Latheronwheel, Caithness, Scotland: Whittles, 1999, repr. 2003). Part III (distributor: bmdpgn@amsolve.com): 'Mature Creation,' *Perspectives on Science and Christian Faith* 56 (2004), 155–6, corr. 239.

[2]François Auguste René de Chateaubriand, *Le Génie du Christianisme* (Paris: Migneret, 1802), Part 1, Book 4, Chap. 5.

[3]Granville Penn, *A Comparative Estimate of the Mineral and Mosaical Geologies* (London: Ogle, Duncan and Co., 1822).

[4]Philip Henry Gosse, *Omphalos: An Attempt to Untie the Geological Knot* (1857; reprint, Woodbridge, CT: Ox Bow Press, 1998). Gosse weakened the case for a mature creation by supposing that all nature is cyclical.

[5]I take Paul to be referring here to Genesis 3, not Genesis 1. His readers were familiar with the Old Testament.

[6]*Big Bang, Small Voice*, 50–3; 'Genesis 1–3 as a Theodicy,' www.biblicalstudies.org.uk/pdf/nelson/theodicy_nelson.pdf

[7]When the psalmist praises God for feeding predators (Psa. 104:21, 24–28), he is praising him for his providence in the world *as it now is* (cf. Mat. 5:45).

[8]K.G. Denbigh and J.S. Denbigh, *Entropy in Relation to Incomplete Knowledge* (Cambridge University Press, 1985), 32–3.

[9]See my discussion in *Big Bang, Small Voice*, Sect. 2.4.

[10]Another Look at the Genesis Flood,'

www.biblicalstudies.org.uk/pdf/nelson/flood_nelson/pdf

[11]I take 2:7–25 as amplifying 1:26–30, as its introduction (2:4–6) suggests. See 'Genesis 1–3 as a Theodicy.'

[12]S.R. Driver, *The Book of Genesis*, 14th edn. (London: Methuen, 1943), xxv–xxviii.

[13]'Another Look at the Genesis Flood.'

[14] See, e.g., Roger Lewin, *Human Evolution*, 5th edn. (Malden, MA: Blackwell, 2005);

Jeffrey K. McKee, Frank E. Poirier, and W. Scott McGraw, *Understanding Human Evolution*,

5th edn. (Upper Saddle River, NJ: Pearson Prentice Hall, 2005); Camilo J. Cela-Conde and

Francisco J. Ayala, *Human Evolution* (Oxford University Press, 2007).

[15]Insertion in Philo's *Questions and Answers on Genesis* 1:87 (Loeb edn., 55, note *i*).

[16] It is tempting to quote Genesis 6:4a, but this is an obscure text.

[17] See John W. Burgeson, 'Notes on *Omphalos*,' www.burgy.50megs.com/gosse.htm (MacKay himself went further than Gosse, and suggested that creation is the bringing into being of the *whole* of our space-time: past, present and future.) [Does any reader know the source of this quotation?]

[18] See John W. Burgeson's review of *Omphalos, Perspectives on Science and Christian Faith* 53 (2001), 127–8.

[19] See, e.g., S.J. Gould, *The Flamingo's Smile* (London: Penguin, 1985), 110–1.

[20] Bruce Denness, 'Divine Artefact,' *Nature* 336 (1988) 614.

[21] J.S. Bell, *Speakable and Unsayable in Quantum Mechanics* (Cambridge University Press, 1987), paper 15.

[22] I develop another in *Big Bang, Small Voice*, Part II.

[23] Cf. Earle H. West, 'Apparent Age,' *Perspectives on Science and Christian Faith* 56 (2004), 154–5.

Book Reviews

C. Stephen Evans and R. Zachary Manis. *Philosophy of Religion*. 2nd edition 2009. Downers Grove, IL, InterVarsity Press. pb. £11.99. 234 pp. ISBN 978-1-84474-399-5

This is a thoroughly revised and updated version of Stephen Evans's 1982 introductory text. Evans, who is Distinguished Professor of Philosophy and Humanities at Baylor University, is assisted by his former student and present colleague R. Zachary Manis. Completely new sections include those on divine foreknowledge and human freedom, Reformed epistemology, the fine-tuning argument, and cognitive psychology. Within the older material, the reader will find useful treatments of the standard topics denominated under the subject heading of 'philosophy of religion', e.g. natural theology, the classical arguments for the existence of God, religious experience, miracles, the problem of evil, faith and reason, and there is a whole chapter on 'Religion, Modernity and Science'.

Philosophy of religion is about assessing the rationality and truth of religious claims, say the authors. However, a 'neutral' perspective is a will-o'-the-wisp and the best that can be attained is a critical honesty. The authors reject the two extremes of naïve fideism and strong foundationalism, and instead opt for a weak form of foundationalism whereby there exist properly basic beliefs but these are not accepted as certain and incorrigible.

The book gives a clear exposition of the traditional Christian theistic understanding of the divine attributes of omniscience, omnipotence, moral perfection and omnipresence. The authors also explain what is meant by referring to God as a necessary being, and distance themselves from those theologians and philosophers who conceive God as 'being-itself'.

The compatibility or otherwise of divine foreknowledge and human freedom as discussed here is a paradigm of how philosophical debate proceeds. The options are carefully presented - timelessness (Boethius), compatibilism, Molinism, open theism - and their merits and drawbacks carefully weighed. Useful references are given, as throughout, for the interested reader to follow up on this question.

There follows an exposition of the classic arguments for the existence of God – the ontological, cosmological, teleological and moral arguments. The authors again carefully distinguish between different forms of these arguments and give the pros and cons in each case. The cosmological argument, for example, might appeal to the contingency of the universe as a whole or to at least some of its parts, and it might be based on the temporal beginning of the universe or on the requirement via the principle of sufficient reason for a cause for a backwardly infinite series of contingent states of the universe or of objects within it.

The authors also state what is gained by the arguments even if, as is generally the case, they fail to deliver proof. In such cases they generally clarify something both about the properties of God and about the consequences of rejecting belief in God. For example, a person rejecting the ontological argument may be forced into the uncomfortably strong position of denying the very possibility of God's existence (67). The authors agree with Aquinas, however, that natural theology tells us at best only that God exists and does not lead to faith in him. This insight moves them to a consideration of religious experience and of revelation.

The authors describe the mystical and numinous as the two main categories of religious experience. They rightly judge that naturalistic explanations do not negate the reality of religious experiences, since God is responsible for the processes of nature and may use them to convey genuine experiences of himself. It is indeed hard to formulate criteria which would rule out religious experiences as genuine without also ruling out 'ordinary' everyday experiences.

One potential objection to veridical experience of God is that any individual's experience

is not shared with others. An answer can be framed partly in terms of Richard Swinburne's principle of credulity, i.e. the claim to have had some experience is in general to be accepted unless there is overriding reason not to. Also the conditions and qualifications for receiving the experience may not be universally shared. However, the fact that some religious experiences contradict each other is only cursorily treated.

Regarding revelation, the authors distinguish between the Bible as containing propositional truth, the liberal view based on Enlightenment rationalism and Biblical criticism, and the neo-orthodox position of Christ himself as the true revelation and Word of God to which the Bible bears witness. The authors discuss the meaning of 'miracle', expound David Hume's classic argument against miracles, and give good reasons for rejecting it, such as the non-necessity of inviolable natural laws.

Evans and Manis refute the claims of Richard Dawkins and others that the natural sciences undermine religious belief, e.g. because God's effects ought to be scientifically observable. Well, they *are* 'scientifically observable' provided that term is broadened beyond meaning merely repeatable in a laboratory to include phenomena such as the universe's fine-tuning and (thinking of miracles) phenomena capable of being empirically observed by some person on some occasion (145). When it comes to the social and cognitive sciences, the authors point out that to draw any conclusion about the truth of religion from an understanding of its sociological or psychological origins is to commit the 'genetic fallacy' (148).

The problem of evil is arguably the greatest stumbling block to belief in God and again the authors carefully categorise different expressions of the problem and different potential counterarguments. Thus moral evil is distinguished from natural evil; the logical problem from the evidential problem; and a theodicy from a defence. There follow useful discussions on soul-making theodicy, Plantinga's free-will defence, and Marilyn McCord Adams's addressing of 'horrendous evils'. One fairly clear-cut conclusion is that the logical problem is a failure; the evidential problem, while not insuperable, is more difficult to counter, since it does constitute *prima facie* evidence against God's existence (171).

The authors note that subjective judgements about the truth of the premises that go into the arguments considered in the book keep coming into play. However, that is true for both atheists and theists, and does not mean that faith is irrational.

Evans and Manis point out the flaws in classic (strong) foundationalism and W. K. Clifford's extreme version of evidentialism, and they provide a useful discussion of Plantinga's Reformed epistemology. However, it does not seem adequate to this reviewer to argue that belief in God might be properly basic; the atheist or enquirer after truth needs reasons to adopt a belief which is not among that person's basic beliefs. Basil Mitchell's building a cumulative case, also discussed in this chapter, seems a more

promising approach.

The book closes with a helpful look at religious pluralism and in particular a critique of John Hick's approach. All in all, the book provides an excellent and admirably clear introduction to the topics covered and is to be thoroughly recommended as a starting point for deeper study.

Reviewed by Dr.Rodney Holder

Joseph Silk. *Horizons of Cosmology: Exploring Worlds Seen and Unseen.* 2009. West Conshohocken, PA: Templeton Press. pb.£12.99. 205 pp. ISBN 978-1-59947-341-3

In this book Joseph Silk, Savilian Professor of Astronomy at Oxford University, takes us on a whirlwind tour of modern cosmology. He opens by discussing the pioneering work of Alexander Friedmann and Georges Lemaître, who solved Einstein's equations of general relativity to find expanding universe solutions, and the observational confirmation of the expansion by Edwin Hubble, who interestingly enough was sceptical about drawing what is now a well-accepted conclusion.

George Gamow's notion of a hot big bang led him and his collaborators to two major insights, namely that chemical element formation could be explained by nucleosynthesis in the early universe and that there should be a remnant radiation field in thermal equilibrium left from the time of decoupling of radiation from matter. In fact Gamow's theory neatly explained the production of helium and a few lighter elements but left the bulk of the elements to be manufactured subsequently in stars. The second prediction was verified by the discovery of the cosmic microwave background radiation in 1964. This effectively put pay to the rival steady state theory of Fred Hoyle who had described the big bang (his own pejorative term for the theory) in a BBC broadcast as 'an irrational process that cannot be described in scientific terms ... [or] challenged by an appeal to observation' (23). For a book in the Templeton Science and Religion Series, it is perhaps surprising that there is no mention of this view being coloured by Hoyle's atheism.

Alan Guth's theory of ultra-rapid 'inflationary' expansion of the universe in the first tiny fraction of a second of its existence is discussed, with the admission that 'Today, cosmologists have a hard time selecting a preferred theory of inflation, and the wide variety makes it very difficult to make predictions that can be tested.' (39, 178). The story here is somewhat disturbing. In the 1990s inflation was tweaked to give an open universe (i.e. negative spatial curvature), deemed more likely from observations. Now it appears from observations that the universe is flat (zero curvature) and 'most inflation models result in a flat universe' (39). Hence, by majority vote, inflation is taken to predict flatness!

Unless already knowledgeable, the reader may well find discussion of the detailed structure of the cosmos bewildering. Astrophysical facts and theories concerning the

fluctuations in the cosmic background radiation, galaxy and star formation, supernovae explosions, supermassive black holes and quasars, interstellar and intergalactic gas, accretion and galactic winds, come like a whirlwind thick and fast, and although there are no equations, some technical terms (e.g. 'emission lines', 81) are used without explanation. There is also some repetitiveness. However, all this gives a flavour of the current scene in astrophysics, with the interplay of theory and observation still leaving much unknown.

That lack of knowledge becomes serious when dark matter and dark energy are discussed, and the reader may be rightly disconcerted at the occasional revelation such as that regarding supersymmetric dark matter particles, 'None have actually yet been observed, which is a minor obstacle' (105). Nevertheless the dynamics of galaxies would be unexplained apart from dark matter, and the apparent acceleration of the universe's expansion is probably best explained by a repulsive force due to a positive 'cosmological constant', now identified with dark energy.

A major problem in cosmology today is the low value of the dark energy. Indeed, according to particle physics calculations, it should be 10^{120} times the value observed. Silk admits there is no explanation for this (121, 128). One line of speculation is that there is a multiverse with member universes taking all possible values of the cosmological constant and ours is 'selected' by the requirement that a low value is essential for the formation of galaxies and hence our own existence as observers.

It is at this point that the discussion starts to become more metaphysical. Silk recognises that another possible explanation for the so-called 'anthropic coincidences', such as the very low cosmological constant, is that the universe may have been designed that way. This possibility is dismissed with Dawkins's naïve question 'who designed the Designer' and the remark that it fails to distinguish monotheism from Valhalla (168).

The main way of achieving a multiverse is as an infinite collection of non-communicating sub-regions in a single overarching space-time. The position of the author on this is unclear. On the one hand he rightly says that 'we can never prove the universe is infinite', and that 'an infinite universe is philosophically unappealing'. Indeed, he says we believe instead that 'the universe is just very, very large' (158). A few pages later he reiterates that multiverse speculations 'reek of metaphysics', are 'impossible to verify', and 'probably even impossible to falsify' (172). He also notes that there are 'curious hints' that the universe could be finite in size (159). Surprisingly one can test whether the universe is finite and therefore unique by more accurately measuring the curvature of space (164). On the other hand, the only way to test whether there is a multiverse is through time travel (180), Silk's treatment of which is speculative in the extreme.

There is also some confusion about what a multiverse would achieve. Thus 'given the staggering array of alternative universes in the multiverse, it becomes exceedingly

improbable that our observed universe should even exist' (162). But the whole point of the multiverse is to make it probable! Indeed, despite all this Silk says, somewhat contradictorily, that 'to my mind the most likely resolution is that there was no selection at all. We are here because we are here. This is what must happen in an infinite multiverse.' (163).

This book is for the more dedicated enthusiast of cosmology and the speculations to which it gives rise, but besides its technical nature another warning is of occasional poor editing which can also confuse the unwary (e.g. neutrons are heavier than protons, not as Silk has it, 169).

Reviewed by Dr.Rodney Holder

R.J.Berry and T.A.Noble (Ed.) *Darwin, Creation and the Fall* 2009 Nottingham Apollos IVP 208pp.pb. £9.99 ISBN 978.1.84474.381.0

The impact of Darwin's theory of evolution was not confined to the apparent conflict between science and the Bible but entered the very heart of Christian doctrine. Even before the publication of the *Origin of Species* the Scottish Evangelical Christian geologist Hugh Miller claimed that if there was no Fall and Adam merely took the first step of an ongoing upward march, then there would be no need for a Second Adam to die for our redemption. It is a criticism that has surfaced many times since then. This collection of essays, originally given as papers to the Christian Study Group of the Tyndale Fellowship, sets out to examine the impact of Darwin's ideas in the light of the doctrines of Creation and the Fall and the problem of evil that caused Darwin so much anxiety.

The opening contribution by David Wilkinson looks at the Christian doctrine of creation from a true biblical perspective instead of simply concentrating on the interpretation of the early chapters of Genesis and the creationist controversy. He centres creation in the worship of the Creator, the centrality of Christ and the anticipation of the new creation. The other essay dealing specifically with the Bible is a short analysis of the language and purpose of the early chapters of Genesis in the light of its Near Eastern background by the Semitic scholar Richard Hess.

The longest chapter is by the editor, 'Sam' Berry, who with his typical thoroughness, gives us a potted biography of Charles Darwin and a brief history of the spread of Darwinism by the adoption of Mendel's discovery of genetics, the subsequent work on population studies and environmental factors, which lead to the Neo-Darwinian Synthesis. The main focus of this chapter, which is entitled 'Did Darwin dethrone humankind?' is an examination of the evidence for human evolution and an attempt to place Adam within that process and how the Fall can be understood within this scheme. Berry believes that the biblical Adam was a real individual, possibly from the Neolithic period (10-20,000 years ago). He was not literally the first man, but was an individual

that God 'breathed into' to become *Homo divinus*. Berry believes that sin was transmitted not through genetic traits but possibly by divine fiat. The Fall is not primarily about disease and disaster, but indicates a fracture in the relationship between humanity and God. He quotes Charles Cranfield, who likened the present state of the world to a concerto, where the orchestra is unable to achieve its purpose because the soloist (humanity) is not doing its part. There is one other chapter, by Darrel Falk, dealing specifically with Darwin and the theological challenges he faced. The problem of suffering in both humans and animals bothered Darwin. This became more acute with the death of his beloved daughter Annie, which led him to see God as a shadowy, inscrutable, ruthless figure. Falk argues that suffering has a part to play in God's providence. Life is an interplay between apparent randomness and the will of God. Suffering is a side effect of the freedom which God wills for his creation and is to be seen as taking place in a world deeply embedded in the love of God.

Four of the eight essays are devoted to an examination of the doctrines of Original Sin and the Fall. The co-editor, T.A.Noble, helpfully gives a theological and historical overview of both paradoxical doctrines. Humanity was created very good but inexplicably disbelieves and disobeys the Creator. Humanity is free to please God but not to believe, obey and repair the breach caused by sin. Noble isolates a number of facets of original sin, which include universality, fallenness, guilt, disease, inheritance and an inner tendency or disposition to sin. He also believes that evil is inexplicable. The Fall like the Second Coming of Jesus, which brings an end to the curse of sin, are outside of time and we should see both the original unfallen state and the Parousia (Second Coming) as proto-time and redeemed time and not part of the present evil age. The atonement brings forgiveness for both individual and group sin, the latter rather than heredity being the vehicle of original guilt through human solidarity and corporate responsibility. A.N.S.Lane does great service in expounding the views of Irenaeus, whose teaching has often been thought to be more compatible with modern scientific views. For Irenaeus Adam and Eve were real persons who were created good but not perfect. They were morally, intellectually and spiritually like children, who could be easily deceived. Like Jesus, who was good and had to be made perfect (Heb.5.9) they had to learn obedience and perfection. Their failure was to 'become like God' in the sense of being their own arbiters of what is good and evil, which is the modern desire for moral autonomy or 'whatever feels right for you is right'. This view allows for 'evolution' of the intellect and moral consciousness and correctly sees the 'Fall', not as a descent from an original perfect state but as a 'coming of age'. Humanity was not created immortal and his rebellion caused it to lose the possibility of eternal life, which can only be secured by Christ's sacrifice.

The last two essays are devoted to the work of Henri Blocher, who has written two popular books on the interpretation of Genesis and Original Sin respectively. In his contribution Blocher summarises his views on Genesis, the origin of humanity, the

nature of evil and the theology of the Fall. Blocher accepts the historicity of both Adam and the Garden of Eden although acknowledges that Gen.3. contains pictorial and symbolic elements. He finds all attempts to explain evil inadequate and rejects the view that animal death and natural disasters are the result of the Fall. The final essay by Richard Mortimer comments on and develops Blocher's work.

Inevitably in such a collection of essays there will be both agreement and disagreement between the authors. The book makes a valuable contribution to the ongoing debates between evolution and creation and particularly concerning the issue of the origin and nature of man. Many of the contributors see the biblical Adam as not the first human being but the federal head of the human race. This raises serious issues that need to be addressed. What is the status of other human beings who were not given a special revelation by God? In what way were they in God's image and how is sin imputed on these other humans? I recommend this volume not only to inform but to stimulate thought on these important issues.

Reviewed by Reg. Luhman.

Norman C Nevin (ed) *Should Christians Embrace Evolution?* 2009 Nottingham IVP
220pp. pb.£9.99 ISBN 978-1-84474-406-0

This is a multi-authored volume from 13 contributors in the theological and scientific fields. As such, there is no index, nor a bibliography, though each chapter is accompanied by many references. It is obvious from the title – which begs the answer “no” – that this volume is polemical. All the contributors share the view that the “theistic evolutionists” (sic) misrepresent scripture when they embrace Darwinian evolution. The chapters which deal with scientific evidence seek to demonstrate the shortcomings of evolution by pointing out inconsistencies of the theory. Hence the volume is an attempt to satisfy believers that evolution cannot be reconciled with scripture.

The question that arises in the reviewer's mind is, why are we still fighting these old battles, and involved in the so-called “conflict” metaphor? This journal – Faith and Thought – is the end-product of the original Philosophical Society of Great Britain which arose in the 1860s to make people aware of the challenge which Darwinism might suggest to the public of that time. Present-day readers must make up their minds about the issues. Certainly there are questions to be raised over Darwinism. The fact remains that evolution is still a theory, and in the future inconsistencies may arise; such is the nature of scientific advance. We talk of faith – a step into the future – and certainty may always elude us. But this is also true of the theological enterprise. If we take a rigid stance over, for example, the early chapters of Genesis, we must be open to differing interpretations. It is not a matter of evolution *or* creation but of *both*. Furthermore, evangelism may not be helped by rigid views. “The conflict between creation and evolution remains an obstacle to evangelisation because it persists so tenaciously in the

minds of non-believers. These people have never had to ask the question from the perspective of faith... and they continue to associate Christianity inextricably with a creationism which they reject in its entirety.... often encouraged by the media and popular discussion” (How to Read the World: Creation in Evolution. Montenat et al. SCM Press Ltd 1985 p13)

To quote from those who recommend the present book: “theistic evolutionary project is so unnecessary.... homological arguments have bitten the dust, junk DNA turns out to be anything but junk, and as to the origin of life itself, biologists haven’t got a clue. In terms of recent discoveries in molecular biology, Darwinism is not only wrong but irrelevant – a Victorian relic”.

The final conclusion of the book under review includes this sentence: “Science has uncovered a great deal of empirical evidence that is challenging to the Darwinian paradigm. Why then do so many want to embrace it? It appears that the only possible reason is the fear of appearing intellectually inferior to the academic consensus” (p220). If it is implied here that those who accept evidence from the Darwinian theory feel unable to take a stand to the contrary, can we take the rest of this book seriously?

Much of the criticism of “theistic evolution” is directed in this volume against scientists such as Denis Alexander (Creation or Evolution: Do we have to choose? Monarch Books, 2008) How much more inspiring is this author’s final page: “We are faced with the huge challenge of reaching a lost world with the message of the gospel. Why not take all that money, energy and human gifting and abilities, and use them for evangelism? What about the medical and economic needs of the world? Instead of putting millions of pounds and dollars into publishing glossy magazines attacking evolution, why not put that money into helping the poor, tackling HIV, or funding orphanages?” (p353)

Reviewed by Dr. A B Robins

Thomas R. Schreiner *New Testament Theology* 2008 Nottingham Apollos IVP 990pp.hb.£ 478-1-84474-309-4

In 2008 IVP published a theology of both the Old and New Testaments. The former, reviewed in the October 2009 edition of this journal, is a great example of brevity and conciseness. The present volume by Thomas Schreiner, a professor of New Testament interpretation, is a monumental *tour de force*, which is both thorough and comprehensive. The author adopts a thematic approach, which he summarises as magnifying God in Christ through the Spirit. He gives an exhaustive summary of the Biblical evidence, often with a linguistic commentary. The whole is set in its historical context (Old Testament, Second Temple Judaism (Inter-Testamental Period) and the Greek and Roman Classical World). He sees the theology as part of the history of salvation and the fulfilment of God’s purposes, although the present age sees the beginning but not the completion of this with the emphasis on ‘already, but not yet.’ He

seeks to avoid distorting the distinctiveness of individual contributions from the different authors by assuming they all contribute to a single systematic theology while at the same time avoiding the opposite error of analysing each book separately and concentrating on the theology of one author, like Paul, or one book and thus failing to give a theology of the New Testament as a whole.

The book takes us on a journey starting with God the Father and majoring into a study of the centrality of Christ for New Testament Theology. The role of Christ and the Holy Spirit are highlighted in Schreiner's exposition of such doctrines as election, grace, redemption, justification and glorification. This leads into an exploration of the law in relation to salvation history. He brings out the practical implications of the theology in chapters dealing with the Church (the people of the promise) and the social world (teaching about wealth and poverty, slavery, government, women and marriage and divorce). He ends fittingly with a final chapter on the consummation of God's promises.

The author wrote the first three drafts of the book without consulting secondary sources and claims that, "The body of literature in New Testament Studies far exceeds the ability of anyone to even come close to reading all that is written." Nevertheless with a bibliography spanning 46 pages with over 1200 references he has done pretty well! Footnotes guide the reader to the relevant literature and often, especially where there are controversial issues, Schreiner will give a summary and an evaluation of what various scholars say. Although this is a conservative work the author is very fair in his treatment of opposing views. This is particularly true of the valuable appendix which gives a reflective historical summary of the subject from the eighteenth century to the present. This is a highly significant book, which cannot be too highly commended, which will no doubt remain a valuable reference work for years to come.

Reviewed by Reg Luhman

James W. Sire *The Universe Next Door* - Fifth Edition 2009 IVP Academic 293pp. £11.99 ISBN 978-1-84474-420-6

James W. Sire was formerly a senior editor at Inter Varsity Press and has lectured in English, Philosophy and Theology. This book, first written in 1976, is now in its fifth edition and has become a standard text on many university courses reading lists. With sales figures in the hundreds of thousands this is a book of significant influence, but summarising its objective is more difficult. The book describes itself as 'A Basic Worldview Catalogue', and Sire himself helpfully gives this outline:

'Formally stated the purposes of this book are (1) to outline the basic worldviews that underlie the way we in the Western world think about ourselves, other people, the natural world, and God or ultimate reality; (2) to trace historically how these worldviews have developed from a breakdown in the theistic worldview, moving in turn to deism, naturalism, nihilism, existentialism, Eastern mysticism, the new consciousness of the

New Age and Islam, a recent infusion from the Middle East; (3) to show how postmodernism puts a twist on these worldviews; and (4) to encourage us all to think in terms of worldviews, that is, with a consciousness of not only our own way of thought but also that of other people, so that we can first understand and then genuinely communicate with others in our pluralistic society.’ (p17)

It is apparent that this is not a book without ambition. Any single volume coming in at under 300 pages would struggle to fulfil these purposes in their entirety but it is testament to Sire’s skill as a writer and academic that in pursuing his objective the book is written in a style which is never less than compellingly readable and persuasive. Extensive footnotes reveal a mountain of source texts and further references which are very welcome in a book of such wide scope. In fact the difficult balance between brevity and comprehension is one of the book’s major strengths; there is much fascinating detail to be enjoyed along the way as Sire surveys the broader landscape of worldviews.

Sire’s methodology is to examine the worldviews he describes in terms of how they answer each of seven basic questions. These are (1) What is prime reality – the really real? (2) What is the nature of external reality, that is, the world around us? (3) What is a human being? (4) What happens to a person at death? (5) Why is it possible to know anything at all? (6) How do we know what is right and wrong? And (7) What is the meaning of human history? In addition consideration is given to the question ‘What personal, life-orienting core commitments are consistent with this worldview?’

The worldviews begin with Christian Theism and it is immediately apparent that there is no attempt made to hide the author’s own preference. Later in the book he states ‘This book is supposed to be a catalog of worldviews. Catalogs are supposed to be dispassionate. Get a grip!’ (p215). This approach is either refreshingly honest or irritatingly skewed according to taste, and the temptation to accuse the book of unwarranted bias recurs throughout the reading. Are the seven questions selected because they objectively define a ‘worldview’ or are they the questions which show Christian Theism in the best light? The chapter on Eastern mysticism in particular seems to struggle to reconcile the structure of the book with a worldview which might not phrase its ‘basic questions’ in quite this way.

The chapter on Islam poses more serious problems. It begins by reminding us of the storming of the American embassy in Iran in 1979 and the horrors of the attack on the twin towers in New York in 2001 and states ‘The worldview of Islam could no longer be ignored’. This leads to the uncomfortable feeling that we are trying to understand Islam in order to understand acts of terror.

Another more general criticism can be levelled at the tendency to emphasise ‘denominational’ differences within other worldviews, whereas Christian Theism is portrayed as a more or less unified consensus. The lack of acknowledgment of the

different viewpoint offered by Roman Catholicism in particular feels like a significant oversight. Of course the problem of what to include and what to omit in a book of this type will always invite criticism, but some of the more polemical passages might prove grating to readers who do not share a Christian worldview.

Sire has set himself a huge task with this book, and he has taken a brave decision in avoiding the usual pretence of 'scholarly neutrality'. None of the criticisms that one might level at it ultimately detract from the achievement of this very useful book. Read as a whole it traces a convincing history of the evolution of worldviews (particularly in the West), as well as providing a robust defence of the enduring validity of the Christian faith and it can also serve as a useful introductory reference book.

In evangelism and apologetics an objection to Christian faith is sometimes expressed along the lines of 'If you were born in India you'd be a Hindu (and so on), why should I be a Christian just because I was born in the West?' This book would be a good recommendation for a person asking such questions, or for the Christian who wants an understanding of how neighbours with other worldviews may think. In our multicultural and pluralistic society it is often true that the universe next door may be very different from our own. The book deserves its reputation as an excellent introduction to those universes.

Reviewed by Dr Alan Kerry

Harold G. Koenig. *Medicine Religion and Health. Where science and spirituality meet.* 2009 Conshohocken Templeton Foundation Press 173 pp plus notes, references and index. Pb £11.99

ISBN 978-1-59947-141-9

This book is a summary of the material in a much larger and more detailed work by the same author. It is unusual in many ways; first, by attempting to summarise the findings of an enormous volume of research in the field of religious belief and practice in its interaction with physical and mental illness. The subject is introduced, then a survey of the immense field is well given, then a discussion of the snags and dilemmas which beset such work, how to avoid them, a reasoned account of why health professionals should take account of religious beliefs and practices of their patients and lastly a discussion of errors which they should avoid.

Secondly, the author tackles the complexity of definition of 'religion'. This is perhaps the book's area of greatest weakness though the problem is unavoidable and to discuss it fully a daunting task in a short account. There are two large problems in this field. One is the impossibility of finding a simple definition of religious belief; the other is that a patient's stated religious preference may represent all kinds of indescribable things about what they actually hold. The author reasons over many pages about this but ends by

choosing the broadest possible meaning of the term 'religion'. This includes all kinds of beliefs and practises, including Christianity, Islam, Hinduism, Buddhism, yoga, Transcendental Meditation, shamanism etc. These are all taken under the term 'spirituality', though much of these attributes are confounded with emotions, with anger, desperation and so on. The author misses the central point of 'true religion' in Scripture which is that it is not religion, which is about what persons do for God, but faith, which is receiving what God has done for a person. The author discusses at times, but inconsequentially, the other problem that religious practices may be done from motives of fear, or anger, or in attempting to influence a deity, whereas in others the same things are done in sincerity, faith or duty.

The book is to some extent misdirected; it is not quite where 'science and religion meet', since science is about things which can be identified precisely and it does not meet coherently with religion, especially as this is described and defined in it. The next difficulty with this book is logical. The great majority of the immense volume of work reviewed is a collected study of associations. So there is at once a risk of fallacy; two things can be associated because they are related causally, but they may also be associated because a third factor is related causally to them both. The author is well aware of this, but oddly postpones discussion of it to his pages 130ff. But throughout the earlier part of the book, though he is clearly aware of this problem he seems to fall into it in several places, especially by adding to a trial result something which he expects everyone to agree to expect on other grounds. No doubt one reason for this is that much of the work reviewed is of weak quality. Several studies are selected as the best, but the author seems to struggle with the ascending value of "cross sectional studies"(synchronous observations in an uncontrolled population), randomly allocated testing methods and therapies given in formal clinical trials. From the mass of published evidence reviewed the author seems to emerge with the belief that there is evidence that 'religion' is linked to clinical betterment; at least it seems impossible to assert that 'religion', as he describes it, causes clinical harm in most illnesses. But the two salient problems remain at least for Christians, that religion as defined here is a vague heap of human beliefs and actions, many opposed to one another and linked culturally to various sectors of the humanity. One example of this arises in a study reviewed (page 124); Muslim men in Leeds had very poor diabetic control because they simply enjoy life "and leave the rest to Allah". Perhaps the most disturbing aspect of the author's approach is that it is the way which today's world accepts in its most cultured parts. The second problem is clear from the author's discussion of logical ambiguities in his later section about "confounders" and "explanatory variables". By these terms the author seems to mean variables open to multiple causes (confounders) and those imposed upon patients from without (explanatory variables) which are taken to be free from causal ambiguity. But they are not, since ambiguity may arise within the patient's own mind or body or both. He also seems to think that some study designs can answer questions

unambiguously; they are much better than other designs, but there are many examples of scientific work where they have failed.

This work is impressive, however, in several ways. It reviews the astonishing ability (in the USA) to conduct clinical trials with tens of thousands of patients, but it is a very useful reference to almost all the work published in the field of religion and clinical diseases. Equally impressive is the discussion of hospital chaplains, though in USA they are encrusted with diplomas and years of training which are acceptable to hospital boards. It is a welcome, well reasoned account of why and where chaplains are needed, how they can help and why they should be members of clinical staff teams, with a logical place in patient care.

Reviewed by Prof. Duncan Vere.

Sarojini Henry *Science meets Faith – an interdisciplinary conversation 2009* The Bombay St Paul Society 255pp \$15.00 ISBN 978-81-7109-986-3

This is a very balanced overview of science and faith, and essential to our understanding, even our very existence. The author is to be congratulated on this. The text is intended to meet the needs of Indian students, but is nonetheless firmly situated in the debates within Western culture.

Of the six chapters, two of these – about half of the book – set out on the one hand the scientific and on the other the theological methodologies. Preceding these is an introductory chapter on the science-faith conversation in today's world. A later chapter sets out an outline of the 'conflict metaphor', dismissed because protagonists on both sides often work from entrenched views. The final chapters suggest that although science and faith could be seen as independent disciplines, a partnership between them is both possible, even desirable, for a fuller understanding of the present state of things.

The whole volume is a delightful read because of the author's ability to express matters succinctly. There is a lot of ground covered in this small volume, so that topics cannot be surveyed in too much depth. They are however well-covered in other places, but seldom so readably as here. It is therefore certainly an ideal volume for students. The reviewer wished such a volume had been available in earlier years when he was a student. The philosophy and history of science were rarely covered then, let alone incorporation of faith as a parallel discipline.

There is an index of the main topics, and each chapter concludes with an extensive list of references.

Reviewed by Dr. A B Robins

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