

## **APPENDIX: A Response to *Should Christians Embrace Evolution?***

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In November 2009 IVP published a multi-authored book entitled *Should Christians Embrace Evolution?* edited by Norman C. Nevin. The work was written with the main aim of critiquing my book *Creation or Evolution – Do We Have to Choose?* [Oxford: Monarch, 2008, available from the on-line Shop at [www.faraday-institute.org](http://www.faraday-institute.org)]. The response that follows to the points made in that book is not intended to be comprehensive but rather to focus on claims that are clearly inaccurate or misleading. The simplest way of presenting these points is to consider them chapter by chapter. Before doing this, some general comments should be made about the general approach used in *Should Christians Embrace Evolution?*

Evangelicals are not always very good at learning how to disagree amicably about secondary non-Gospel issues, and a good start is to avoid personalizing debates and instead sticking to concepts and ideas. I therefore took considerable care in *Creation or Evolution* (particularly when discussing Intelligent Design) to quote extensively from proponents of Intelligent Design to allow them to explain their own position in their own words. Unfortunately the same courtesy is not always displayed in *Should Christians Embrace Evolution?* In fact the book uses many of the debating strategies that are more familiar in secular books than in Christian literature. These include:

- Misrepresentation of the position held by one's opponent to render it easier to criticise.
- 'Guilt by association'. Link your opponent's position A with a more extreme position B, and then critique B as if your opponent believes B rather than A.
- Assume that if your opponent believes A then s/he must also believe B, an inference made by the critic, although in reality the person being critiqued does not believe B and indeed thinks that the inference is unjustified.

Some examples of these strategies will be given in what follows.

The Conclusion of *Should Christians Embrace Evolution?* (p. 215) states that "The accusation leveled at Christians who do not embrace evolution is that we are opposed to science". Unfortunately the book as a whole gives precisely that impression because (apart from getting a lot of the science wrong, on which more below) no alternative scientific theories are proposed to explain the data discussed. A good scientific theory provides an inference to the best explanation of the data under consideration, but *Should Christians Embrace Evolution* (henceforth abbreviated to SCEE) critiques evolutionary interpretations of the data without suggesting any alternative scientific explanations, which for scientists weakens the position being suggested.

In what follows the material in SCEE is considered chapter by chapter with page numbers provided referring to points raised. This approach entails

that minor and major points are mingled together according to the sequence of the material. Quotes from *Creation or Evolution* are in blue.

## **Preface**

**p. 13** ‘His theology might be described as novel but it could certainly not be described as mainstream’.

I am sorry to disappoint, but there is really nothing in *Creation or Evolution* that is novel! (apart from recent scientific findings of course). All the theological positions and Biblical interpretations have been absorbed from that great generation of evangelical leaders who pioneered the IVF (now UCCF) student work in the latter decades of the 20<sup>th</sup> century – people such as Jim Packer (who wrote a kind endorsement for *Creation or Evolution*), Oliver Barclay, Derek Kidner, Donald MacKay, John Stott, R.J. Berry, Colin Russell, Donald Wiseman, Jim Houston and many others. Oliver Barclay has always been a keen theistic evolutionist ever since reading zoology at Cambridge and then during all those years in which he nurtured the IVF after taking over from Douglas Johnson, and founded the *Research Scientists Christian Fellowship*, which later became *Christians in Science*. The ‘Model C’, which I present in my book, comes straight out of the writings of John Stott, Derek Kidner (in his Tyndale Commentary), Sam Berry and others.

So I am a little surprised to find my theology described as not ‘mainstream’, given that it has been shaped by the key British evangelical leaders who have developed the work of IFES and the Christian Unions over the past 70 years. I think we can all safely agree that those who hold to the

common key biblical doctrines that define our evangelical faith all hold to ‘mainstream theology’, and we can then agree to differ on secondary issues. There is a real danger in some evangelical circles these days of making creationism into the ‘new circumcision’, a particular way of interpreting Scripture that has to be added on to Christ’s finished work on the cross before someone becomes a “real evangelical” or “mainstream”. The New Testament has much to say about such attitudes.

Ironically, in the evangelical environment in which I was raised, the type of creationism defended in SCEE was simply invisible. I have compared notes with other Christian friends who were contemporaries during my years as a student at Oxford in the mid 1960s, and all are agreed that we had simply not heard of creationism in that era, and it certainly played no part in the thinking or outreach of the OICCU (the Oxford Christian Union) at that time, of which I was President. Only later on did I start encountering Americans with creationist beliefs, and I have to say that was a big surprise – I didn’t know such people existed!

## **Chapter One – Evolution and the Church**

**p. 15** Very minor correction for the pedants: Kingsley’s fine letter (18 Nov 1859) was 6 days before publication not 4!

**p. 20.** “It would be premature to say the least to commit to a scientific position without having a clearly worked out theology that accords with it...”

I think this advice is unnecessarily timid. We are living in God's world and all that we uncover as scientists reflects God's power and wisdom in creation. For sure there will be some theological challenges along the way, but surely we should be encouraging believers to see science as part of worship: all truth is God's truth. Much better advice is to follow the scientific data wherever they lead, secure in the knowledge that we are exploring God's world.

**p. 21** In discussing my 'Model C' in the context of understanding Adam and Eve, and the question of the image of God, this author misses out several key elements of the Model in order to make his creationist Model look stronger. But Model C proposes that the image of God at the beginning is graciously bestowed upon the whole of humanity through the Federal Headship of Adam. The image of God is not, as the author of this chapter seems to be suggesting, a matter of genetic inheritance, but of God's sovereign choice. Model C may be wrong (I emphasise that I hold any Model relating theology and anthropology only tentatively), but I think it's important to at least try and understand a Model properly before trying to critique it.

**p. 21** The author raises the spectre of future human evolution. In fact evolutionary biologists are generally agreed that significant evolutionary change in humans is unlikely to occur, and the reasons for this are provided in Chapter 10 of *Creation or Evolution* in some detail. There are of course some human genes currently displaying natural selection (especially some involved in providing resistance to pathogens), but this is very different from the kind of genetic changes that would cause humans to be something non-human.

**p. 22.** The author claims that Darwin thought that the idea of the immanence of God and the notion of natural selection were mutually exclusive. The way that the author has chosen to set up the discussion here is problematic as Darwin did not, to the best of my knowledge, ever use the theological language of God's 'immanence' in creation. When Darwin wrote the *Origin* he appears to have been a deist, believing that God set up the initial laws and created the initial living forms, but then had little further to do with the process of natural selection. Many of his Christian contemporaries (Asa Gray, Aubrey Moore etc) disagreed. It was over the question of design (inherited from Paley) that Darwin struggled, not over 'immanence'. Anyway, just because Darwin's theology was lacking a robust Biblical theism does not mean that ours should.

**p. 22.** Refers to Stephen Jay Gould's often-repeated claim that if the whole of evolution was repeated again then it would result in a different end-point. The author then makes the egregious claim that "Alexander is challenging that view because it cannot be reconciled to his theology". Not so. In fact in the section headed 'Intelligent Evolution' in Chapter 15 I spend many pages in explaining the good scientific reasons why Gould was wrong. Note also that that section starts with the sentence: "In chapters 3–5, we showed that, taken as a whole, evolution is far from being a chance process. It is tightly organised and highly constrained.". This is based on science not on theology. The most powerful scientific arguments may be read in the fine book , *Life's Solution – Inevitable Humans in a Lonely universe* (CUP, 2003) by Simon Conway Morris which is cited in that section.

**p. 22.** How is God 'directing' natural selection? There seems to be a deistic sub-text underlying this question. If we are to take the immanence of God

seriously (“Nature is what God does”, Augustine), then we will see God’s intentions and purposes being worked out in all the processes and mechanisms of the created order that we seek to understand as scientists. God is the author of the whole script, not just of little bits of the script.

**p. 23.** Back to Model C again. The author correctly draws out the parallelism between the federal headship of Christ and that of the first Adam, but then goes on to say that “It is very difficult to understand how one among several millions and who had been predated by others could properly be said to represent the whole”. But if we take the language of Federal Headship seriously as applied to the second Adam, that through Him millions of people past, present and future, now have access to the throne of grace, then surely it is not so difficult to take the Federal Headship of the first Adam equally seriously?

**p. 24** introduces a real jumble of ideas and there seems to be considerable confusion here. The author seems to be implying that evolution *ipso facto* implies genetic determinism. But this is simply not the case. I don’t often find myself defending Richard Dawkins, but even Dawkins is certainly not a genetic determinist! (read the last few pages of *The Selfish Gene*). Dawkins believes that we have genuine free-will and that we are not the prisoner of our genes. Actually there might be some genuine genetic determinists around in the scientific community, but if there are, they must be a very rare species and I have never met any.

The author seems to be implying on this page that I am some kind of genetic determinist, when I spend a lot of my energy arguing that humans have genuine free-will. The author suggests that I think the Fall is not a ‘big deal’. But I argue precisely the opposite – that it is a very big deal indeed because it resulted in sin, death and alienation from God coming into the

world as a result of Adam and Eve's disobedience. If it wasn't for the Fall, clearly there would have been no need for Christ coming into the world to die on the cross to save sinners. So how this author thinks I don't think the Fall is critical in Christian theology, I have no idea!

**p. 24.** "A naturalistic definition of science rules out any consideration of a Christian worldview from the data that science uncovers". This is a tautology. Naturalism refers to the philosophy that excludes the supernatural. Therefore, for the Christian, naturalism must be wrong: naturalism and Christianity are mutually exclusive. No Christian can possibly believe in "a naturalistic definition of science".

**p. 25.** On the pastoral issues, Chapter 13 entitled 'Evolution, natural evil and the theodicy question' is written specifically to address such issues.

## **Chapter Two – The Language of Genesis**

**p. 26.** The author states that the purpose of his chapter is to "respond to a number of statements" made in *Creation or Evolution*, but then goes on to discuss all kinds of positions that I neither hold nor even discuss in *Creation or Evolution*. This chapter adopts the classic 'guilt by association' approach: my name is planted in the midst of views that I simply don't hold.

**pp. 29-30.** I do not discuss in *Creation or Evolution* the question of the authorship of Genesis and certainly claim no expertise in that area. I was careful in *Creation or Evolution* to refer in general to the rival creation stories extant over the period that Genesis was being written and edited. Remember that Moses was brought up and so presumably educated as the grandson of the Egyptian Pharaoh. His education would surely have included teaching about the great Egyptian sun-god Ra, and the other



polytheistic gods of Egyptian religion. As Stephen recounts for us in his great martyrdom speech: “Moses was educated in all the wisdom of the Egyptians and was powerful in speech and action” (Acts 7:22). So it is a perfectly reasonable exercise to see in what ways the Genesis accounts confront and contrast with ancient Near Eastern polytheistic beliefs. Dr Richard Hess from Denver Theological Seminary has an interesting book supporting the idea that it was the pagan Canaanite creation myths that Genesis is mainly confronting (*Israelite Religions: An Archaeological and Biblical Survey*, 2007).

A particularly helpful account in this regard is also provided by John H. Walton’s recent book *The Lost World of Genesis One: Ancient Cosmology and the Origins Debate* (IVP Academic, 2009). Had this been published before I wrote *Creation or Evolution*, I would certainly have cited it. Prof. Walton has clearly made a very thorough study of ancient Near Eastern creation mythologies. His suggestion, like mine, is not at all that these provide the sources for the biblical material, but rather that they help us to understand the thought forms of the people of this era, and therefore cast light on the way that the first readers of Genesis 1 would have read the text. Clearly the assumptions and interests of the ancients were very different from our own, and seeking to read the texts as much as we are able through the eyes of the ancients is surely a healthy first step in the interpretative process.

**p. 31.** The author’s ‘Assumption A’ is that the Genesis texts were “derived and dependent upon” other Babylonian texts (plus p. 35). That is not my own position and neither does *Creation or Evolution* suggest that.

**p. 35.** The author's 'Assumption B' is that "the Genesis text has undergone a process of demythologization". I certainly don't believe that either! But then rather confusingly the author cites a passage from *Creation or Evolution* on the same page where I do indeed suggest that the ways in which the Genesis monotheistic account contrasts with the rival creation stories of the same era, do shed some interesting light on the text. On p. 36 the author then seems to be trying to link this point with belief/disbelief in evolution in a way that I found confusing. There are plenty of Biblical scholars who have been discussing the interpretation of Genesis in its Near Eastern context for more than a century (particularly as knowledge of ancient Near Eastern religious beliefs has greatly increased during this period), but who I'm sure have no interest at all in evolution either way. The study and interpretation of the text should be carried out in its own context, not by importing modern questions to the text that were simply of no interest to the contemporary authorship or readership.

**p. 38.** At the bottom of this page we find what I find to be a very odd inference, namely, that if someone believes that understanding the contemporary cultural milieu of Genesis helps to shed light on the text, then *ipso facto* this means that one cannot read Genesis 2 chronologically. Sorry, but the logic here completely escapes me. Surely that is a separate question altogether and has to be assessed in its own right on internal textual grounds? I know of no ancient Egyptian, Sumerian or Babylonian texts that are relevant to answering that question.

**pp 39-40.** Again the reason that the great majority of English translations do not use the pluperfect tense in Genesis 2:5, 2:8 etc is simply because, as the author knows, there is no pluperfect in Hebrew verbs, and the form of the

Hebrew verbs used in Gen 2 is the same as in Gen 1 where it is translated as the simple past. This is why the King James version and other early translations are consistent in using the simple past tense in both Gen 1 and 2 (presumably not as a response to Darwin!) because that's what the Hebrew actually says. Only in more modern translations like the NIV do we find the modernistic and concordist tendency to try and fit the text to chronology.

I really do think that this passion to force chronology on to a text that is uninterested in chronology is a classic example of how not to handle texts (and what does the author make of the sun and moon being created in Gen 1 on the 4<sup>th</sup> day?). I do recommend to this author to read John Walton's book mentioned above. Having lived in the Middle East for 15 years, I can assure this author that even today notions of time in that part of the world are very different from our western notions – how much more so thousands of years ago.

This author seems concerned that some great theological truths might be lost if we don't treat Gen 2 chronologically, but I think the boot is on the other foot, there are dangers of theological loss if we do. The whole point of Gen 2 is surely to reverse the order of Gen 1. In Gen 1 Adam was created in God's image as the culmination of God's creative actions on the 6<sup>th</sup> day. Gen 2 now makes Adam the centre-point of the narrative from the beginning and explains in the rest of the chapter what being made in the image of God really entails.

### Chapter Three – Adam and Eve

I appreciated this chapter in that the author is really seeking serious engagement with the material in *Creation or Evolution*, and even though I think has misunderstood some of it, the topic of exactly how we interpret the Adam and Eve narratives is certainly a challenging one.

**pp. 43-46.** I of course agree with the author’s biblical arguments for Adam as a real historical figure.

**p. 47.** A word on the use of ‘model’ might be worthwhile here. If I ever get to a 2<sup>nd</sup> edn of *Creation or Evolution* then I’ll spend a bit more space in explaining the way in which scientists use the word ‘model’ – I think I assumed too much understanding on the part of the reader on this point. In science there are data and there are models, and it is the task of the latter to incorporate the former and make sense of them. Models are human constructs, they are not the data themselves. The challenge is to see which model makes best sense of the data. In an analogous way one can take the biblical theological account concerning Adam and Eve as the author helpfully reviews on pp 43-46, and then look at the account of the origins of anatomically modern humans (*Homo sapiens sapiens*), and see what kind of model might allow these two data sets to ‘talk to each other’ in a coherent kind of way.

So the author’s little summary of my position on p. 47 is in the first instance about the anthropological data, not about the model itself. The scientific anthropological data are really pretty clear: anatomically modern

humans first start appearing in Africa about 200,000 years ago. Those are the data, not the Model itself. The author then implies that my Model C involves ‘denial of a historical Adam’, whereas in fact I spend many pages in *Creation or Evolution* arguing for the reality of a historical Adam! As Chapter 12 states under the heading ‘Model C’: “Model C, it will be remembered, proposes that Adam and Eve were real historical people, dubbed *Homo divinus*, the progenitors of God’s new family on earth, comprising all those who would enter into a personal relationship with God by faith.”

p. 48. This is where the author starts really misrepresenting Model C. The problem comes with thinking that the biblical teaching about the ‘image of God’ is referring to a kind of ‘thing’ that is bestowed upon humankind at a particular moment in time, whereas I would want to say that the teaching found in the ‘manifesto literature’ of Genesis 1 about the ‘image of God’ refers more to the purposes of God for the whole of humankind without any particular reference to chronology (a topic which I don’t think Genesis 1 is interested in). An illustration from John Walton in the book mentioned above might be helpful. Let us imagine that a new College is being built over a period of a few years, and then finally the students and staff arrive and the first term begins: the College is now fully functional. At what point is the College ‘created’? I think most people would want to say that it is the creation of the functionality of the College that marks its true creation, much more than pointing to the bricks and mortar, building of the lecture theatres etc. So it is with humankind made in the image of God: full functionality of the concept begins (in Gen 2) as *Homo divinus* have fellowship with God and hear his commands for the first time.

Now as it happens R.J. Berry expresses Model C slightly differently in a way that would probably have avoided the misunderstanding that this author expresses. Prof. Berry suggests that God's image was bestowed on Adam as the Federal Head of the whole of humankind at a particular historical moment and therefore biblical 'image of God' teaching is, in a sense, about chronology in this understanding. The problem I found in expressing Model C in precisely these terms is simply that, having looked quite a bit at what the Bible teaches about humankind made in the image of God (including Genesis 1), it seemed difficult to express this deep theological insight as if it were a 'thing' bestowed upon people. Rather it looks much more like a functionality that is created by God as his vision and purpose for the whole of humankind, more to do with 'manifesto' literature than with chronology.

As it happens, the precise way that the 'image of God' is expressed in Model C doesn't really change the Model that much, and the author really has no excuse in misrepresenting the Model as much as he does, for example by suggesting (p. 49) that "the Model has sin before the fall". No it doesn't! And, no, Adam "wasn't sinful already". The core biblical idea of sin in the Bible centres around a broken relationship with God, and you can't break a relationship unless you have one in the first place. The author should re-read *Creation or Evolution* Chapter 12 where the whole Chapter is arguing that sin came into the world through the particular disobedience of Adam and Eve at a particular time in history. For example: "the Fall in model C becomes the disobedience of Adam and Eve to the expressed revealed will of God, bringing spiritual death in its wake, a broken relationship between humankind and God. In an extension of this model, just as Adam is the

federal head of humankind, so as Adam falls, equally humankind falls with him. Federal headship works both ways.” In comparing the various Models, I write that:

“If the Genesis Fall account is either purely ahistorical and figurative (model A), or the story of the gradual alienation from God that occurred during some unspecified early era in the emergence of *H. sapiens* (model B), then the interpretation of the Fall can readily start to centre around human antisocial behaviour, or the emergence of conflict, or even just human behaviours required for basic survival. But, important as these things are, I would suggest that they do not bring us to the heart of the biblical doctrine of the Fall, which is not about sociobiology, but about a relationship with God that was then broken due to human pride, rebellion and sin against God – with profound consequences for the spiritual status of humankind, and for human care for the earth. The Fall is about moral responsibility and sin, not about misbehaviour, and sin involves alienation from God. A relationship cannot be broken by sin unless the relationship exists in the first place.”

The author also speculates on God’s purposes for those members of *Homo sapiens sapiens* (anatomically modern humans) before the time when they came to know God by grace and receive His commands (within the framework of Model C). I would like to quote again from *Creation or Evolution* on this particular point:

*Creation or Evolution* Chapter 10: “Model C will not answer all the theological questions that one might like to ask. For example, what was the eternal destiny of all those who lived before Adam and Eve? The answer really is that we have no idea. But we can be assured with Abraham: ‘Will not the Judge of all the earth do right?’ (Genesis 18:25). Thankfully we are

not called to judge the earth, and we can leave that safely in the hands of the one who ‘judges justly’ (1 Peter 2:23). The question asked about those who lived prior to Adam and Eve is not dissimilar to other questions that we could ask. For example, what was the eternal destiny of those who lived in Australia at the time that the law was being given to Moses on Mt Sinai? Again, we really don’t know and, again: ‘Will not the Judge of all the earth do right?’ Christians who spend time speculating about such things can appear as if they are the judges of the world’s destiny, forgetting that that prerogative belongs only to God.”

*Creation or Evolution* Chapter 12: “For example, if something like model C is correct, what does the Fall imply in practice for the local aboriginal population of Australia whose ancestors had been living there for tens of thousands of years prior to the lives of Adam and Eve in the Near East? The short answer, of course, is that we don’t know. Thankfully, as already emphasised, God is the just judge of the world, not us, a fact which personally makes me very relieved”.

**p. 51.** “implications for the understanding of God as sovereign creator”. I actually didn’t understand the point being made here (ditto bottom of p. 49 “working by someone else’s rules”). We are all agreed that God is completely sovereign over His creation, so I don’t see how this doctrine is being questioned by any of the various Models under discussion.

**p. 53.** The author suggests that Model C implies that that as Adam fell (in Model C) then Australian Aborigines began to share the guilt of Adam. I don’t suggest this, actually, for the reasons explained above. The nuclear explosion of humankind’s first sin may have exploded in the Near East at a particular time and place, so that the fallout of sin enveloped the world, but



exactly how God judges those alive at the time is in His hands not ours. It is also worth noting that the Bible insists that people are responsible for their own sin and it is for their own sin that they will be punished (Deut. 24:16; Ezek. 18:20). Yes there is such a thing as communal guilt, and yes the effects of an individual's sin "extends to the third and fourth generation", but people are responsible for their own actions. Indeed it is a matter of fact that "all have sinned and fallen short of the glory of God" (Rom, 3:23), but surely the author does not believe that we inherit sin, and therefore imputed guilt, through our genes? Denial of the (bizarre notion) that sin is genetically inherited does not make one a Pelagian. If sin were genetically inherited, then what humankind would require is some genetic engineering, not the atoning work of Christ upon the cross!

**p. 55.** I don't understand the sentence about "disconnected branches of *H. sapiens*". No-one is suggesting there are disconnected branches, and it's clear based on genetic data that we are genetically all of one stock. Model C is not about genetics, nor about evolution, but about when and how *H. sapiens* first started knowing God in a personal way as the one true creator God who graciously revealed Himself to humankind. The model may be wrong (as *Creation or Evolution* emphasizes!) but it certainly doesn't imply a physically fragmented humanity. Of course Christ assumed "our humanity" (p. 55).

**p. 56.** The author suggests that his particular interpretation of Adam and Eve cannot be denied without "severe consequences". But there are also "severe consequences" of completely ignoring the science, not least pastoral consequences. There can also be "severe consequences" of seeking to over-interpret Scripture, or insisting that texts have to be interpreted as if they

were talking about genetics or modern science. The point about constructing Models is to see how we can take both the Bible and science seriously. The author of this chapter certainly wants to take the Bible seriously, which is fine, but chooses to simply ignore the science. That's where there can be severe pastoral consequences, because believers who come out of churches or Bible Colleges where Gospel truths have been tightly pinned on to literalistic and modernistic ways of handling Scripture, who then go and study science at university and discover that such interpretations are incompatible with science, are then faced with the real danger of thinking that they have to choose between science and faith. Some, indeed, end up by throwing the baby out with the bath water. The secular world is littered with atheists and agnostics who have been on this reverse pilgrimage away from faith. For those of us who spend much of our time in apologetics and evangelism, mingling every day with sceptics and atheists, these are very real and tragic encounters. So my fear is that the kind of approach expressed in this chapter will just lead to more people eventually rejecting the Gospel altogether, which would indeed be a tragedy.

#### **Chapter Four. The Fall and Death.**

**p. 58.** Referring to fellow believers who do not agree with your particular interpretation of Scripture as displaying “a great deal of intellectual ‘sleight of hand’” is quite pejorative and not worthy language of a minister of the Gospel.

**p. 58.** It would be interesting to know what this author means by ‘fiat creation’ and by ‘death before Adam’. Does the author intend to infer that Adam as the very first *Homo sapiens sapiens* literally appeared out of the

dust in an instant as a fully formed adult human being? If so, when did that happen? And is that how all species were created? And by saying that death came into the world only with Adam and Eve's sin, is the author claiming that there was literally no physical death of any kind viz no bacterial, plant or animal death? Or is the author referring only to human death? The language used seems to suggest the former (plus top of p. 67), but it's not clear. Without really knowing what model the author is suggesting, then it is difficult to comment.

**p. 60** "Christ restores the world to how it was in the beginning...etc". I am not sure how the author gets this from Romans chapter 5. Verses 17, 21, etc in that chapter, are surely referring to the present blessings of the Gospel and to the new heavens and the new earth – the passage is looking forward, not back to Eden. In any case, if we look at the earth strictly "at the beginning", then Gen. 1.2 says that it was 'formless and empty': if you really want to get serious about chronology and go back to the beginning, then that's the biblical description!

**p. 71.** In seeking to interpret the Bible in a scientific manner, as if it were referring to a (miraculous) speciation event when it refers to the creation of Adam (and animals as well? presumably so, if there is no animal death before Adam), the author runs into all kinds of difficulties, but in any case the discussion depends a lot on tilting at windmills. The author says "If Adam was a fictional and mythical character..." etc. But none of us believe that (including the 'progressive creationists' whom the author lambasts on p.70), so why attack a position that none of us believe? I believe that Adam and Eve were real historical figures, that sin and spiritual death came into the world when they fell, that Adam was indeed the 'federal head' of the

human race as the author expounds at the top of p. 62, and that the only way out of our sinful condition is through Christ's atoning work on the cross. So theologically we are all agreed, and I certainly agree with much (though not all) of the biblical exposition of this chapter, so wouldn't it be better to focus on the theological agreement that we have, rather than trying to insist that the Gospel collapses unless we impose quasi-scientific interpretations on biblical texts?

Again, as with the previous Chapter, my main worry about this Chapter is a pastoral one. If we teach our young people in the churches that the integrity of the Gospel hinges on such items as disbelief in animal death before the fall, or miraculous speciation of *Homo sapiens sapiens*, then pretty soon when they go to university they will realize that such beliefs are untenable and throw the baby out with the bath water. Sadly it happens a lot. I don't doubt the sincerity of people holding to such positions, but the unintended consequence is often loss of faith. Furthermore, the kind of rigid position exemplified in this Chapter makes it a lot more difficult for the Gospel to be taken seriously by those who seek to share the Gospel in the secular world.

### **Chapter Five: Creation, Redemption and Eschatology**

This Chapter exemplifies the classic debating strategy of trying to misrepresent your opponent's position, preferably (as in this case) by accusing him of some bad heresy, thereby making his position much easier to attack. In fact theistic evolutionists are often accused of bowing to materialism, so I thought it was rather ironic that this author was now accusing us of not being materialist enough – it seems you cannot win in this discussion!

As it happens the author's attempt to pin a 'gnostic tag' on to *Creation or Evolution* really doesn't work. Indeed, one does wonder whether this author has actually read *Creation or Evolution*, or perhaps has just not read it very carefully. As already mentioned, *Creation or Evolution* spends many pages arguing that Adam and Eve were real physical individuals who fell from fellowship with God, based in particular on the comparison that Paul makes in the New Testament between the First Adam and the Second Adam. On p. 79 the author states, referring to genealogies, that "Whereas Gnostic-influenced modern theologians and preachers have often found them easy to ignore (Alexander finds no space in his 300 plus pages to say anything about them), the Bible writers in both testaments were very interested in genealogies". But if the author re-reads *Creation or Evolution* Chapter 9 ('Who Were Adam and Eve?') then he will find the following extensive passages about genealogies, all intended to underline the fact that the Bible treats Adam as a real historical figure:

"In the *toledoth* found at the start of Genesis 5, introducing the 'account of Adam's line', we find that just as Adam was created in God's image, so Adam 'had a son in his own likeness, in his own image; and he named him Seth', and it is Seth's onward genealogy that is then described in the rest of this chapter."

"The godly line leading from Seth culminates with Noah and his family in 5:32, but the family history and likeness is picked up again in the *toledoth* of Noah who 'was a righteous man, blameless among the people of his time, and he walked with God' (6:9)."

"Genealogical data are also consistent with Adam and Eve being real historical figures who lived around 6000-8000 years ago. Although the

seventeenth century Archbishop Ussher famously generated a date for Adam and Eve based on biblical genealogical information that placed their creation at 4004 B.C., in fact even in Ussher's time there was a range of estimates. The reason for this is that biblical genealogies can use 'son of' in the sense of 'descended from', thereby summarising many generations in a single brief phrase. Genealogies are also sometimes presented in the Bible in a formalised way to make theological points, rather than for historical completeness, as for Matthew's genealogy of Jesus, which is arranged in three groups of 14 generations in Matthew 1, although this involves omitting several of the generations mentioned in the relevant Old Testament lists. As it happens, the precise designation of date makes little difference to the main idea underlying model C.

Luke's genealogy (Luke 3: 23–38) certainly appears to highlight both the identity of Adam as a real historical figure, as well as his designation as the 'son of God', one who was part of God's new family on earth: '...the son of Enosh, the son of Seth, the son of Adam, the son of God' (Luke 3:38). The general stance of scripture is to view Adam as a historical figure, and we will consider some of the relevant New Testament passages further, in the context of the Fall, in the following chapter."

Given that the author of this chapter has not taken the trouble to read or understand the position that he is seeking to critique, further comments on this chapter regarding the 'gnostic' claim seem unnecessary. Those who believe that Adam and Christ were real physical historical persons are not gnostics.

p. 73 "Attempts to join Darwinian evolution with the Bible..." It is not clear here whom the author is seeking to critique, but if he is referring to *Creation*

*or Evolution*, then *Creation or Evolution* is arguing the opposite – it is taking a non-concordist position, that the Biblical text cannot and should not be interpreted as a scientific text.

p. 79. The author claims that I “relegate Genesis to the status of a theological novel”. But *Creation or Evolution* nowhere suggests anything of the kind. First, the book of Genesis as a whole contains several different types of literature, so one’s hermeneutic stance cannot be monolithic for the book taken as a whole. Second, the word ‘novel’ suggests that it contains a made-up story (or stories), which I do not believe. Third, the author appears to be suggesting that if you call something ‘theological’ then it implies that it’s somehow “less true”. But for me theological truths are the greatest truths there are, much more important than scientific truths. This is relevant to the authors comment on p.81 concerning the early chapters of Genesis being ‘non-historical’. Something can perfectly well be historical in the sense that it happened in space and time, but the genre of the narrative may not be the same as that written by a modern historian. The author appears to be falling into the familiar modernist trap at this point.

**p.82.** Here we find more excited language. Because I do not share exactly the same interpretation of Romans 8 as the author, my position is declared ‘incoherent’. But the passage in question is indeed not that simple, and the wise person would be cautious in declaring someone ‘incoherent’ who does not exactly agree with them on every point. At the top of p. 83 the author claims that *Creation or Evolution* suggests that Paul did not believe in a physical fall, but I claim no such thing, only that the Rom. 8 passage is open to various interpretative stances, a fairly modest claim I would have thought.

**p. 87.** In the top paragraph the author ascribes to me a view of the resurrection which I do not believe, and the absence of any citation to a specific page number in *Creation or Evolution* supports the idea that this is a deliberate misrepresentation in order to create an easier target for critique. Of course I believe that the death and resurrection of Christ reverses the effects of the fall – again I don't think that this author has really bothered to read *Creation or Evolution* carefully enough.

**p. 88.** Top. I don't believe the coming “new heavens and new earth” are disconnected from the present earth in the way the author suggests, and *Creation or Evolution* does not suggest this.

**Conclusions:** This is the most extreme of the various chapters. The author specializes in misrepresentation. Indeed the intemperate (and indeed one has to say un-Christian) language utilized is very characteristic of those tedious blogs in which bloggers express their emotions but forsake rational arguments. It is surprising that the Editors of this volume let this chapter through. One would have thought that a sharp-eyed Editor might have noticed that its author was making unsupported claims about the material under discussion. If you want to mount a coherent critique, then the first step is to try and understand the opposing position and present it fairly, before embarking on the critique. This chapter fails to do that.

### **Chapter Six: The Nature and Character of God**

**p. 94.** The author appears to believe that Adam and Eve, animals and plants, were first created in their mature physical form with the appearance of age,



even though they weren't really old. The argument is that this was as a result of God's sovereign choice and for the good of the animals, plants etc in some way that is not very clear. Curiously on p. 93 the author suggests that there are no creationists today who support the views of Philip Henry Gosse (who, by the way, did not, despite the author's claim, suggest that the apparent age of Adam was there to "test our faith" – although others have made that claim), but then basically confirms Gosse's position as his own! But I do not think that anyone will doubt that if things are given an apparent age by God, but were really created a few minutes ago, then this portrays God as if a deceiver on a grand scale. As the Revd Charles Kingsley wrote of Gosse's book *Omphalos* (in which he expresses these views), fearing for his childrens' spiritual health: "I would not for a thousand pounds put your book into my children's hands". I would feel the same way. Of all the many claims made in this volume that, sadly, will tend to make people take the Gospel less seriously, this one is probably near the top of the list. The 'nature and character of God' is well described for us in Scripture: a God who is 'the Rock, his works are perfect, and all his ways are just. A faithful God who does no wrong, upright and just is he' (Deut 32:4), and 'God is not a man, that he should lie' (Num. 23:19). On p. 97 the author suggests that "there is something amiss when it is suggested that God might be deliberately misleading people" – indeed so! But the author seems to miss the point that such situations only arise when the Young Earth Creationist position, as here, is being proposed. The author tries to delve into the philosophy of science to rescue his impossible position, but there's no need to even go to science in order to make the point. If a child goes out to the forest to count the tree-rings on a very old and recently felled tree in order to determine its age of a thousand years, but is then informed that the tree was

“really” created the previous day – what do you think the child might infer? Sadly the YEC position led an Australian geologist called Ian Plimer to publish a book in 1994 with the title ‘Telling Lies for God: Reason vs Creationism’ (Random House Australia). I chose not to cite this book in *Creation or Evolution* because I can understand that the title might seem offensive to my creationist friends. Nevertheless I do think that the title stands as a sad indictment of the kind of position that the author of the present chapter is seeking to defend.

**p. 95.** The author suggests that the ‘genetic fossils’ with which our genomes are littered do not provide evidence for our evolutionary past on the grounds that “many” do in fact have functions. This is straightforward misinformation. For example, would the author like to list the functions of the many thousands of pseudogenes found within our genomes? Many are full of point mutations, truncations, indels etc that provide them with no Open Reading Frames whatsoever, or their regulatory domains are damaged so that they are not expressed for that reason. So what functions exactly does the author have in mind?

**p.98.** The author claims that theistic evolution implies that “all evidence for God’s handiwork is excluded from science by definition”. But the whole of science for the Christian reveals the wonders of God’s creation. The point is surely that Christians who are scientists spend all their days exploring the created order. The author might like to re-read a section from *Creation or Evolution* in chapter 8:

Does that mean that Christians who are scientists provide ‘naturalistic explanations’ when they write their scientific papers? Of course not.

Christians believe that all biological descriptions without exception are attempts to understand God's world. Scientists are engaged in a voyage of discovery through the universe that God has brought into being and continues to sustain. We can only discover what God has already created, for there is nothing else to discover.

Now we understand what some Christians wish to say when they refer to science as providing 'naturalistic explanations'. They simply wish to point out that we don't invoke God in our scientific explanations for the various reasons given above. But I would like to suggest that the use of the adjective 'naturalistic' in this context is quite inappropriate. When I walk into my laboratory I do not suddenly stop believing in God – far from it, I go in as the Christian explorer looking forward to uncovering more of the wonders of God's world. The more we discover, the more we glorify God by revealing his thoughts in the created order.

We don't call Christian accountants 'naturalistic' because of their absence of theological terminology as they check the company accounts, any more than we expect our doctor to use theological language when she tells us that we've got the flu, or the mechanic to refer to biblical texts when servicing our car. The absence of specific references to God does not render our lives suddenly 'naturalistic'. Quite the opposite: Christians walking with God in the power of the Spirit will be only too aware of God's presence and leading, permeating every aspect of their daily lives. Naturalism is the philosophy that there is no God in the first place, so only an atheist can provide truly naturalistic explanations for anything.

For the same reason I would not myself use the term 'methodological naturalism'....etc

**p. 98** “the probabilistic nature of quantum mechanics”. The author must surely know that this is a red herring. The scientific properties of biological materials represent averages of trillions of quantum events. There are some very rare and fascinating examples where quantum events as quanta impinge on biology (as in certain events in photosynthesis), though these are rare indeed.

**p. 100** The author doubts that material truth can be arrived at “independently of God’s special revelation”. But has he not heard of Calvin’s notion of common grace? Surely it is the fact that all humans are made in God’s image, cracked though that image may be by sin, that allows them to create wonderful music and art, and to have insight into the wonders of God’s creation, even when they do not acknowledge God as creator? It is the great strength of the reformed tradition that it sees the whole of life as providing an opportunity to explore the works of God. I like these words from the Calvinist poet Johan de Brune [1588-1658]: 'Wheresoever Truth may be, were it in a Turk or Tatar, it must be cherished...let us seek the honeycomb even within the lion's mouth'.

**p. 100.** We are here exhorted to weigh the claims of science against Scripture. This is the clearest claim that I have seen that Scripture is indeed like a rival science text-book. We are back to modernism again. There seems to be a tacit admission here that the only ‘true truths’ (to borrow Francis Schaeffer’s phrase) are scientific truths. Surely not. It does not elevate Scripture to press its texts out of context to interpret them as if they were modern scientific truths.

**pp. 103-7.** In the first section here (pp 103-5) the author writes a good section on creation theology in relation to miracles, presented somewhat as if its supposed to be a critique of *Creation or Evolution*, though I'm not sure how, as I think we're all in agreement on this biblical material. But then on p.106 the author suddenly makes a big hermeneutical leap to seek to apply the New Testament language of miracles to the early chapters of Genesis! But surely biblical passages should be interpreted within their own context? It is surely more important to seek to understand what the author of Genesis is telling us in the context of his own time and culture – not to impose upon the text the language and framework of a much later period of God's revelation to us.

**p. 106.** The author suggests that I am “denying the miraculous aspect of the creation account”. Not really. I am simply pointing out the intriguing point that the Bible itself doesn't utilize the language of the miraculous in making these accounts, so we should be asking ourselves why this is the case, that's all. It doesn't lessen the fact that the whole of creation is the work of the wise and powerful creator. But the Bible is actually quite careful in its use of those several words that are translated as 'miracle' or 'miraculous' in English, and I am suggesting that we should follow Scripture in like manner.

**p. 107.** “Forms of theistic evolution that deny any direct involvement of God in creation”. The author needs to re-read the section in chapter 2 of *Creation or Evolution* headed *God is immanent in his creation*.

## **Chapter Seven. Faith and Creation.**

**p 109.** “I suspect that the most common tool used by satan today in his attack on historic Christianity is the theory of evolution”. This is quite a strong assertion for which the author provides no supporting evidence. It may be that the author has been influenced by that small sub-set of biologists, such as Richard Dawkins, who seek to invest evolution with an atheistic agenda. Of course non-Christians will tend to justify their non-belief by appeals to something that they know something about, be that biology, history, sociology or whatever. But the Christian will see the whole created order, and therefore all academic disciplines, as but ways of exploring God’s creation. With reference to the specific claim made by the author, I know of no-one who has lost their faith through evolution, but I do know many people who have lost their faith through being told by well-meaning Christians that they have to choose between the Gospel and evolution. I also encounter many non-Christians in the scientific community who refuse to take the Gospel seriously because it is connected in their minds with a rejection of science.

**p. 110** There is no evidence that Peter, Luther, Calvin etc thought the world was flat. Everyone in medieval times knew the world was round. The idea that people in the “dark ages” thought the world was flat was an invention of writers in later centuries.

**p. 110** Bottom sentences display ignorance concerning the meaning in science of the word ‘theory’. Ditto top of p. 111 concerning the word ‘proved’. Outside of the more mathematical sciences, the word ‘proof’ is rarely used in science, and certainly not by biologists.

**p. 114.** The author suggests that there is some particular affinity between theistic evolution and panentheism. I can certainly think of one example of someone holding that position, the late Arthur Peacocke. But because a few, like Peacocke, are panentheistic evolutionists, doesn't mean that the rest of us are!

**p. 115.** The author suggests that Hebrews 11:3 refers to all living things, but that's not what the verse says as it refers to the "universe" being formed at God's command. It is the universe that "was not made out of what was visible". In any case, the standard YEC position is that God made the original 'kinds' of animals and plants, and there has then been incredibly rapid evolution since that time to produce all the species we see today from the initial kinds that were created *ex nihilo*. So if the author is referring to the biological diversity that we see all around us today, then it was indeed "made out of what was visible".

**p. 115.** The foundations of evolution are apparently crumbling based on the words of an unattributed scientist on the 'eastern seaboard' of America. Citation details might have been useful here!

### **Chapter Eight. Towards a science worthy of creatures in Imago Dei.**

I have debated Steve Fuller amicably a couple of times and both on these occasions, and indeed in much of his writings, find it hard to identify things that I disagree with concerning the role of religion in the rise of modern science. Prof. Fuller is an agnostic/atheist who defends Intelligent Design. However, I always have the impression that when Steve is talking about

Intelligent Design (ID), he's not really referring to ID in its Discovery Institute version, but much more to traditional design arguments that have been in use by Christians (and others) for many centuries. But then ID proponents like Bill Dembski spend many pages in their books arguing that ID is not the same as these traditional design arguments....so the language game gets a bit tricky at this point.

I once wrote a 500pp+ book (*Rebuilding the Matrix*, Lion 2001) arguing that modern science should be reincorporated within a biblical theistic matrix, so I really don't think we're in any kind of disagreement on the importance of a theological framework in the historical development of modern science.

**p. 120.** I am fascinated that the author can see into the mind of Galileo to discern what he would have thought about theistic evolution! Actually I rather think Galileo would have appreciated it, but in any event I'm not sure that invoking 'authority figures' from the history of science to support (or not) theories about which they knew nothing, is really that useful.

**p. 125.** I found the author's discussion here about Liminal Christians interesting. The aim is to recruit 'cultural Christians' into supporting ID, and indeed I think the author is correct that they are natural bedfellows. The other authors of this volume might well wish to meditate on why this is so.

**p. 136.** Since this chapter is not really about a critique of *Creation or Evolution*, I won't add other comments here, except to say that the author's contention on this page that 'evolutionists' want to suggest different terms upon which belief in God and belief in science are grounded, is incorrect. For example I spent a whole section in *Rebuilding the Matrix* illustrating the



many similarities in the ways that scientific and religious truths are justified. The similarities are, I think, more striking than the differences.

### **Chapter Nine. Interpretation of Scientific Evidence.**

**p. 139.** “Because some organisms have similar structures doesn’t mean that the organisms had a common ancestor”. Well, true, God could have created everything separately and miraculously, and given different species similar molecular and morphological ensembles so that it looks as if they are all connected up historically, when really they are not. Science is about choosing between rival theories, and it is a pity that the author did not at this juncture spell out more clearly his own rival theory to evolution so that the reader could weigh up the evidence. It is also a pity that the author did not cite Simon Conway Morris’s fine book *Life’s Solution – Inevitable Humans in a Lonely universe* (CUP, 2003), already mentioned above, which is very relevant to the discussion in this section, because the well-known phenomenon of evolutionary convergence does provide yet another kind of explanation for homologous entities in independent evolutionary lineages.

**p. 139** “Detailed studies at a molecular level”. What studies? No citations are provided and Anthony Latham (cited here), who is not a scientist, and whose book I have read, is a poor guide on such matters.

**p. 140.** “The assumption that a genetic programme directs embryonic development has been questioned”. The author tries to support this statement with a few trivial examples, but to be honest the whole huge weight of the contemporary evo-devo (evolutionary development) research programme is

against the author's contention. I can think of dozens of labs around my own university of Cambridge pumping out results each week that contradict the author's claim on this point, not least the Gurdon Institute (or the Sean Carroll lab in Chicago: [www.molbio.wisc.edu/carroll/](http://www.molbio.wisc.edu/carroll/)), where the author's claim would be treated with amazement. What about the hox genes and all those other sets of wonderful developmental genes whose evolution has been tracked in such minute detail?

**p. 142.** "The genetic code is not universal". As a bald statement this is misleading: it would be more accurate to say that "the genetic code is virtually universal and the exceptions are so rare that they become reasons for investigation and subsequent scientific publications". Or to quote the Abstract of a recent paper: "The genetic code is nearly universal" [Koonin, E.V. et al., *IUBMB Life* 61: 99-111, 2009]. As the author will know, many of the unusual variants have been found in mitochondrial rather than nuclear DNA, although even there the variations are tiny compared to the whole standard code. (e.g. one variant out of the standard 64 codons). Interestingly many of these differences are shared between vertebrates and evolutionarily ancient organisms such as the cephalocordate *Branchiostoma* [Boore, J.L. et al., *Mol Biol Evol*, 16:410-8, 1999]. The standard code appears to be "wobbly" in some codons in some contexts, leading to alternative codon use [e.g. Tourancheau, A.B. et al., *EMBO J.* 14:3262-7, 1995]. The evolutionary consequences of alternative codons has also been investigated e.g. in some *Candida* yeast species which decode the standard leucine CUG codon as serine, thereby reprogramming the identity of approximately 30,000 CUG codons existent in the ancestor of these yeasts and having a profound effect on their evolution [Miranda, I. et al., *Yeast* 23: 203-13, 2006]. In fact the

interpretation of the CUG codon has now been switched back to the normal leucine by the genetic engineering of these yeast, and not surprisingly this results in a viable but much modified organism, providing strong evidence of codon switch as a mechanism for speeding up the evolution of these organisms [Miranda, I. et al., PLOS One 2:e996, 2007].

So, ironically, the minor variants in the genetic code fit very well within the theory of evolution, and indeed it is not clear anyway why the present author makes the bald statement that “The genetic code is not universal”. The aim seems to be to give the impression that are many different codes and that life must have had many different sources. But this suggestion is not supported by the data, and the citation provided is to the work of a philosopher, not to the scientific literature. Indeed, the near universality of the genetic code is one of the strongest arguments that we have for the existence of a last common ancestor of all living things in the world today, a remarkable observation.

**p.142.** The author mentions the existence of ORF (Open Reading Frame) genes which encode proteins having, as yet, unknown functions (by the way, citation 17 here has the wrong page number: it should be p. 697 not p. 689). The relevance of this point to the author’s argument is not made clear. Yes determining gene function takes time and often a lot of hard work...so...?

**p. 142.** The author makes the very bold claim that homologies in anatomy contribute no support for evolutionary theory. I would love to see him in debate with an anatomist on this point!

## **9B The Nature of the Fossil Record.**

**p. 144.** ‘The tree of life’. The author fails to bring out the main point of the New Scientist article cited, which is to point out that the metaphor of the ‘tree of life’ really only applies to that era of evolutionary history when lateral gene transfer ceased to provide the main driver of evolutionary change, as it clearly appears to do in microbial evolution. Once the flow of genetic inheritance is almost entirely vertical - the dominant mechanism in animals, for example, since the Cambrian - then the tree metaphor (or I prefer a bush) becomes relevant. But either way it makes no difference to the point that all of life has a single common ancestor, an inference strongly supported by the near universality of the genetic code.

**p. 146.** One of the worrying aspects of this chapter on fossils is its tendency to cite journalists and philosophers; only 2/21 citations appear to be from palaeontologists, and several assertions are made without any rooting in the scientific literature. James LeFanu cited here is a journalist!

**p. 147.** “To take a series of fossils and claim that they represent a lineage cannot be tested scientifically”. This is one of those classic claims, so beloved of Henry Morris and others in the YEC movement, that reveal their commitment to a kind of Baconian science that, if applied strictly, would lead to complete silence about past history. Clearly the ‘historical sciences’, such as geology, palaeontology etc, depend on the general approach of an ‘inference to the best explanation’ (IBE), very similar to legal reasoning, or the way that theologians make inferences about authorship of a biblical book, or indeed Christians support the evidence for the resurrection in their apologetics (cf Morrison’s ‘Who Moved the Stone?’). The reason that

evolutionary history represents such a powerful theory is because it renders coherent a vast range of data, including anatomy, in a way that is so much better than rival theories. Of course there are a lot of data, not least genetics, where contemporary experimental approaches are highly relevant (as in the codon reinterpretation experiment mentioned above), but for fossils it is clearly the IBE which counts. If the author has a better IBE than evolution, then let him state it, but unfortunately this chapter, as with the others, is entirely negative, devoid of any attempt to construct a rival theory.

**pp. 149-50.** The author makes a huge leap from p. 149, where there is a reasonable description of the role of ‘genetic fossils’ in the genome, to p. 150 where the unsubstantiated claim is made that somehow the ENCODE project has changed the situation, and even that “most of the supposedly useless DNA now appears to perform useful biological functions”, which is an exaggeration. First, we are all agreed that the term “Junk DNA” used by an earlier generation of molecular biologists, was unfortunate. As the author will have read in *Creation or Evolution* Chapter 3 :

It is an unfortunate fact that very early on in DNA research, the DNA not used for encoding proteins was written off rather dismissively by some scientists as ‘junk DNA’. Big mistake. It is now becoming clear that much more than 5% of our DNA might have important functions, though the jury is still out as to how high that percentage might be<sup>1</sup>. A big surprise is the finding that mRNA comes not only from protein-coding genes, but also from many other parts of the DNA that have, as yet, no known functions. A major project called ENCODE (‘The Encyclopaedia of DNA Elements’) is currently under way and its aim is to identify all the parts of DNA that are

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<sup>1</sup> Pearson, A. ‘Genomics: junking the junk DNA’, *New Scientist* 11 July 2007.

functional<sup>2</sup>. The field of genomics is rapidly turning upside down many previously held ideas in genetics, and there will almost certainly be many more surprises to come.

But, second, this in any case is irrelevant to questions such as the use of pseudogenes and retroviral insertions as ‘markers’ of evolutionary history. The whole point about a pseudogene, for example, is that we know that it contains certain mutations that destroy the ORF or the expression of the gene – that’s why it’s called “pseudo”. This is indeed a case where the author’s stringent Baconian ideals for science can be more than adequately fulfilled (pseudogenes can be tested in the lab and indeed genetic engineering can readily convert them back to functional genes).

So, third, the author’s suggestion that because we have now found functions for some other parts of the genome, this then renders the argument for evolution from ‘genetic fossils’ less powerful, is simply a *non sequitur*. There is no connection between the two points. Of course if it could be shown that all the pseudogenes, transposons and retroviral insertions that constitute roughly half our genome, are functional, then that would at least change the nature of the discussion, but the ENCODE project hasn’t shown that at all, so the author’s claim is very misleading on this point.

### **9C. Chromosomal fusion and common ancestry.**

**pp. 151-156.** Here we find the discussion of the fusion of chimp chromosomes 2p and 2q to generate the present human chromosome 2. This author’s strategy here and elsewhere in this volume is to accept the basic fact

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<sup>2</sup> Check, E. ‘Genome project turns up evolutionary surprises’, *Nature* 447: 760-761, 2007.

(lets call it ‘Fact A’) that is being presented, then to discuss all kinds of other points that sound as if they might be relevant (lets call them ‘Facts X’), but aren’t really, and then come back to Fact A and say because of Facts X, Fact A can’t be used in support of evolution. As a political strategy this works quite well, because most readers who are non-geneticists will get lost anyway after a page or so of Facts X, so will probably feel that the author must know what he’s talking about when we finally get back to the author’s punch-line that, ergo, Fact A can’t support evolution.

But the misleading character of this strategy is well illustrated in these pages. None of the Facts X mentioned are relevant to the basic Fact A, which really does provide very strong supporting evidence for our common ancestry with the apes. Then another smokescreen is thrown up on p. 156 by pointing out the well-known genetic differences between our genomes and that of the chimp. Well, sure, but so what? The author refers somewhat disparagingly to the “rather simplistic views of Alexander” because I “fail to mention any of these details”, referring to the differences between the human and chimp genomes. But as a matter of fact *Creation or Evolution* does summarise the various differences between these two genomes in some detail in reference 135 – maybe the author missed that. Of course the genomes are quite distinct – if they weren’t we wouldn’t be as different as we are! But it’s not really clear what point the author is trying to make at this juncture – it doesn’t make the chromosome fusion data go away, or lessen it one whit as clear data demonstrating our common descent.

**p. 157.** The author then suggests that because the fused chromosome is only found in the human lineage, this means that it is not good evidence for evolution. But this completely misses the point! In this case it is because it is

not found in the ape lineage that it represents such good evidence, for the very reasons that the author himself has just summarized in the previous pages. The IBE for the fusion of two ape chromosomes to generate a single human chromosome is that the last common ancestor of both lineages had two chromosomes which then fused at some time during the evolution of the human lineage.

This page then shifts back to irrelevant ‘Facts X’ by remarking that there are other examples of chromosome fusions in other animals. Well, sure, but the data are hardly relevant to the data under discussion, and indeed count against the author’s next assertion as mentioned below.

We then have the final extraordinary claim that “What is certain, however, is that the wide variety of chromosomal variations that clearly exist between the human and chimpanzee, dictate against the thesis that these species have common ancestry”. I have to admit that I had to blink twice to make sure that I was reading this bald assertion at the end of this section! The author has just told us how readily chromosomal changes can occur even within a species, plus Figure 1 on page 152 has also shown us the very remarkable similarities in size and synteny between human and chimp chromosomes. All these data are very consistent with the existence of a last common ancestor between these two lineages and the author has presented no data at all to undermine such a conclusion.

**Conclusion:** I do not wish to be rude, but if this chapter was submitted as an undergraduate essay here in Cambridge, then it would be returned covered with red ink and the student would be heading for a third-class degree. But of more serious concern once again is the pastoral issue. If students read this



kind of scientific material, then link it with the trustworthiness of Christians as they proclaim the Gospel, then find out later that the scientific material is simply wrong, there really is then a danger that they will mistrust what Christians tell them about Christ.

## **9D Information and Thermodynamics**

**p. 158.** This section starts by claiming that “Creation occurred by the spoken word of God” but that I have “skillfully sidestepped” this point in *Creation or Evolution*. I have to admit some surprise when I read this, given that I rather major on this point at several places in the book e.g. here are some quotes:

“There has been much recent discussion about how exactly God does interact with the world. The main answer that the Bible gives is that he does so by that most personal of activities – speaking: ‘And God said’ is repeated again and again in Genesis 1 to describe God’s creative actions. ‘The Mighty One, God, the Lord, *speaks* and summons the earth from the rising of the sun to the place where it sets’ (Psalm 50:1), not meaning a literal voice with sound-waves, but communicating power, authority and information so that the created order operates harmoniously.

The supreme biblical example of God’s communication is of course Jesus himself, the Word of God. Christians worship not the written word, but the incarnate Word of God: ‘In the beginning was the Word, and the Word was with God, and the Word was God’ (John 1:1) and we have already noted that it was through Jesus, the divine Word, that “all things

were made; without him nothing was made that has been made' (John 1:3]. Jesus *speaks* to the waves and they obey him (Mark 4:39–41). We are living in a universe created, shaped and sustained by the personal God who speaks, Father, Son and Holy Spirit.”

“One of the striking features of Genesis 1 is its insistence that the one true God speaks the divine Word and everything comes into being day after day in obedience to his Word”.

“When we speak as humans, the world changes – nothing is quite the same as it was before we opened our mouths to speak, a sobering thought. How much more is this the case when God speaks, bringing things into existence by top-down causation through his powerful Word.”

So I am happy to report that we are at least united in our theology of creation on this point, although I have to admit that when I read the author’s opening claim, I did wonder whether he had actually read *Creation or Evolution* – a fast skim read maybe?

**p. 163.** At the bottom of the page the author seems to be confusing evolution (the natural selection of genetic variants) with origin of life studies, clearly not the same. So the comment about “random mutations” finally bringing together the “full complement” of amino acids is confused, or at least confusing, because I don’t think anyone in the origin of life field thinks that’s how it happened anyway, so its not clear here what theory the author is trying to critique.

**p. 165.** “The design thesis now gaining ground in the scientific world...” Since the author has not yet defined this thesis, it is difficult to know how to

assess this bald assertion, which is made without supporting data or citations.

**p. 165.** But here at last at the end of this apparently very hurriedly written section we have the first clear statement in this book of the alternative position that the authors appear to be seeking to defend: “special *ex nihilo* creation; the creation of animals and man without common descent” etc. As one of the best-known YEC proponents in Britain, the author should also have added a “young earth” for the purposes of complete disclosure. But it does seem odd to me that this book sets out to nit-pick the views of others without providing any coherent alternative scientific view. At least here on p. 165 we have a clear statement of what this alternative might be, although of course the actual scientific data give no support to this alternative, which is perhaps why the authors of this volume make no attempt to defend it on scientific grounds. There simply is no attempt to integrate their science and their faith, which is why this volume as a whole is so depressing.

### **Chapter 10. Does the genome provide evidence for common ancestry?**

Here we come back to this author’s favored strategy of presenting the mutually agreed Fact A, and then generating a smokescreen of irrelevant Facts X.

**pp 167-175.** Pseudogenes. The author suggests that because some pseudogenes have been shown to acquire new functions during evolution, that this then implies that they can no longer provide evidence for common descent, evolutionary histories etc. Not so. Ironically the author cites a

review on pseudogenes (citation 5: Annual Rev of Genetics 2003) from the laboratory of Francisco Ayala, one of the world's most vocal critics of creationism and ID. What the review says is what we all know: that genomes have a tendency to be 'Scottish' – waste not want not – if a gene has lost its original function then it's perfectly possible that it might pick up a later function later on. As Ayala points out, the high preservation of pseudogenes in vertebrate lineages compared to, for example, *Drosophila*, requires explanation and there is evidence for the acquisition of new putative functions for some pseudogenes. But this is merely a 'Facts X' smokescreen in the present context when considering the use of pseudogenes in tracking evolutionary lineages. The fact that a pseudogene may or may not acquire a new function different from its original function does not necessarily reduce its use as a genetic marker for evolutionary history, but in any case the author's suggestion that most or even all pseudogenes have some unknown function is simply not supported by the data. Most have no open reading frames, or are truncated, or crippled by mutations in regulatory regions, which is how of course they are identified as pseudogenes in the first place.

And the author here discusses the excellent example of the pseudogene GULO, but again distracts the reader with irrelevant data. The suggestion is made (based on some ancient literature from the period 1956-74) that because there is some evidence that foetal levels of ascorbic acid in some circumstances are higher than might be expected based purely on maternal diet, therefore this sheds doubt on the role of human mutated GULO as a pseudogene. But this is a non-sequitur. The pseudogene GULO still exists in the human genome, clearly a degenerate gene as the author emphasizes, irrespective of whether or not there might be foetal mechanisms for making

Vitamin C. This is yet another ‘Facts X’ smokescreen, except that in this case the smokescreen ‘Facts’ do not even appear to be correct.

As evidence that the author is truly muddled on the subject of pseudogenes, one need only refer to his comment on p.175: “if evidence is found that clearly demonstrates that humans (and, for that matter, chimpanzees) can synthesise ascorbic acid in the early stages of life, it will provide more direct evidence that pseudogenes have important biological functions”. But it wouldn’t provide any evidence for such a conclusion at all – degenerate GULO would still be sitting in the genome as a molecular fossil reminding us of our evolutionary past. The author’s claim is simply irrelevant to the use of pseudogenes to demonstrate our evolutionary inheritance.

**pp. 175-177.** Olfactory receptor (OR) genes. Once again we have here an irrelevant collection of ‘Facts X’. The author cites a couple of recent papers that seek to provide more accurate estimates of the number of olfactory genes and pseudogenes in various primate and other mammalian lineages. So the numbers in each class have been revised somewhat in the more recent literature compared to the earlier literature. So what? That doesn’t change one whit the important point that pseudogenes in general, and OR pseudogenes in particular, provide some incredibly powerful data for our common descent. Ironically Table One of Go and Niimura (2008), the paper that the author cites in ref 25, provides a wonderful data-set that illustrate the power of evolution as an explanation for genetic data (by listing the functional and pseudogene OR repertoire in human, chimp and macaque, according to their syntenic chromosomal locations). Obviously Go and Niimura interpret their data within the framework of evolution, and indeed

there is no other explanation for their data. Once again the present author provides no alternative explanation for the simple reason that he doesn't have one.

**p. 177.** The short summary on pseudogenes here is misleading and scientifically inaccurate.

**pp 177-183.** Mobile genetic elements. On p. 179 the author complains that *Creation or Evolution* does not contain citations to the data on Alu insertions. It is true that in response to my publisher's desire to make *Creation or Evolution* accessible to the general reader, I sought to keep academic citations to a minimum: *Creation or Evolution* is intended as a popular not an academic book. However, as it happens the author is wrong that citations are lacking to the relevant literature. The following citation numbers are relevant here:

“Footnote 131: The pseudogene examples shown here are taken from an excellent review on the topic by Finlay, G. ‘*Homo divinus: The ape that bears God's image*’, *Science and Christian Belief* 15: 17-40, 2003. This review contains many other examples.”

Footnotes 132 and 133 are both citations to this same review (although I note that there is a typo in the date of the review, which should be 2003 not 2005), which contains around 100 original citations to the relevant literature.

**p. 179.** The citation regarding the Alu insert which the author complains is missing is:

Gibbons R, Dugaiczyk LJ, Girke T et al (2004). Distinguishing humans from great apes with AuYb8 repeats. *J Mol Biol* 339, 721-29 (Figure 1d, top

sequence alignment).

**p. 179.** The author seeks to cast doubt on the usefulness of inserted transposable elements as ‘fossil’ genetic records demonstrating our common inheritance with the apes. This attempt is made in the first instance by appeal to Hedges et al (Genome Research 2004). The first point to note is that Hedges et al clearly do not think that their data do anything to undermine the fact of our common inheritance with the apes, arguing simply that their approach of comparing chimpanzee chromosome 22 with its human homologous chromosome 21 “allows for a more unfiltered appraisal of Alu retroposition activity since we last parted ways with our chimpanzee relatives”. The second point to notice is that the main topic of this paper is irrelevant to the point that the present author is seeking to make. Hedges et al are reporting that the number of new Alu insertions (viz new since the last common ancestor) in the human chromosome is higher than in the chimpanzee homologue. So what? That makes no difference to the use of Alu inserts as genetic fossils to track evolutionary history. The author makes clear that he has not understood the use of Alu insertional data as ‘genetic fossils’ by his assertion (p. 179) that because different species have unique Alu insertion sites as well as common repertoires, therefore “This unique species distribution of Alu sequences renders Alexander’s words meaningless”. But it is precisely the unique species distribution which proves of such great assistance to evolutionary biologists in reconstructing evolutionary lineages! And of course the commonality of Alu and other transposable element insertions is in any case huge. There are more than 1.2 million copies of Alu inserts in primate genomes, and the vast majority of these are shared between human and chimpanzee. Alu elements alone comprise about 10% of the human genome.

The third point that the author makes, arising likewise from the Hedges paper, is at least more relevant to the matter in hand: Hedges et al report a highly unusual (actually unique so far in the literature) example where there is an insertion at the HS6 locus in the orangutan, gorilla and human but not in the chimpanzee. As Hedges et al state: “In the only previously reported instance in which an Alu element appeared to be excised from a genome, remnants of the Alu insertion remained in the sequence”, but this is not the case for HS6. Hedges et al. then go on to give some quite reasonable explanations as to how this may have happened. But what I find very disturbing about the present author’s use of this example is his attempt to base his argument on a single exception, ignoring the fact that human and chimpanzee share thousands of Alu insertions at unique homologous chromosome sites! This is just not the way that science is done: if you have thousands of examples all pointing in one direction, you do not then try and base a case on a single exception – unless of course you want to pull the wool over the eyes of your readers, which is what seems to be going on here.

**pp. 179-80.** The same pulling-wool-over-the-eyes strategy is used here in the discussion concerning Alu recombination-mediated genomic deletion (ARMD), citing Han et al (2007). The author reports the Han paper correctly as describing the identification of 663 lineage specific Alu deletions in the chimpanzee lineage, but then goes on to conclude (which Han et al do not) that Alu insertions can therefore no longer be used as ‘genetic fossils’ for tracking evolutionary history. Not so. The first point to notice is that this is a tiny number compared to the hundreds of thousands of Alu insertion sites shared between chimp and human; it just means that one needs to base evolutionary data on a very large number of examples (which is easy in this



case as there are so many to choose from). Again, it is a very defective strategy to draw general conclusions from the exception. Second, Han et al do us a service by noticing that ARMD's occur at 'hot-spots' – they are not random. In fact the hotspot sequence contains the pentanucleotide motif CCAGC which is known to stimulate recBC-dependent recombination. This identification makes it therefore easier to identify sites at which ARMD may have occurred. All the data of Han et al mean is that one should be careful in the use of Alu insertions for tracking evolutionary lineages. Of course such data are in any case not used in isolation, but in conjunction with data from pseudogenes, retroviral insertions, fossil data, anatomy etc etc.

**p. 181.** On the functionality of Alu sequences. We are here faced with another Red Herring. Of course transposable elements, pseudogenes etc can on occasion have functional consequences, or develop into actual functional genes by the route of mutational change. Indeed it is one of the ways in which new information comes into the genome. So what? It remains a minority of Alu sequences and the author's claim (p. 182) that "these findings are suggestive evidence that normal Alu sequences have important roles" is not supported by the evidence. The fact that some Alu inserts occasionally acquire functional significance upon which natural selection then operates, is not a sound argument for suggesting that "normal Alu sequences have important roles".

**p. 183.** I found the author's statement on this page rather ridiculous: "Alexander appears to have used one or two examples to justify his evolutionary philosophy". It is ridiculous for two distinct reasons. The first is that the author knows full well that there are hundreds of examples (probably thousands) in the literature of the use of transposable elements as

sound data for tracking evolutionary lineages (the Finlay review is a good place to start for the general reader). Obviously for a popular book (which some readers in any case find too technical!) it is not good to load the text with too many technical examples. The second is that I spend large sections of *Creation or Evolution* explaining why evolution is not a philosophy! Maybe it's a philosophy for this author, but it's certainly not for those, such as myself, who see it as simply the best current biological theory that we have at present to explain the origins of biological diversity.

**p. 185.** The author here makes an important error, claiming that HERVs have common pre-integration sites so that they are “not distributed in a haphazard manner”. Not so. In fact the endogenous retroviral endonuclease recognises a site only 4-6 nucleotides long (depending on the class), but very promiscuously, so their integration is indeed random, apart from a preference for active chromatin. This randomness is of course likewise seen in integration sites in retrovirally-induced cancers, where no two cancers have the same integration site. As far as LINE-1 and Alu elements are concerned, papers have been published demonstrating that independent insertions into the same site in different species are too rare to be quantified. They are indeed essentially homoplasy-free markers. It is therefore significant in this context that the present author provides no citation for his false claim. This is not surprising as his claim is indeed not supported by the literature. Randomly distributed retroviral insertions such as HERVs therefore do remain as very powerful data demonstrating our common inheritance with the apes. The chances of independent infectious retroviral insertions happening at precisely the same spot in different genomes is extremely remote, and the author is therefore clutching at straws (p. 186) in

suggesting that there have been “independent species infection”.

The author might like to read some of the other reviews by Graeme Finlay which explain the use of pseudogenes, transposable elements, retroviral insertions etc in tracking evolutionary lineages e.g.

G. Finlay ‘Evolution as created history’, *Science and Christian Belief* 20: 67-90, 2008.

**p. 186.** This chapter finishes with a final non sequitur for which this chapter must surely hold the record. The claim is that because some of the DNA previously rather unwisely labeled as ‘junk DNA’ now appears to be more likely to have some function, therefore this in some way (not explained) undermines Darwinian evolution. On the inappropriateness of the term ‘Junk DNA’ we are agreed. Indeed the author will find this sentence in *Creation or Evolution* as previously quoted above (p. 59):

“It is an unfortunate fact that very early on in DNA research, the DNA not used for encoding proteins was written off rather dismissively by some scientists as ‘junk DNA’. Big mistake. It is now becoming clear that much more than 5% of our DNA might have important functions, though the jury is still out as to how high that percentage might be.”

For some mysterious reason the author feels that such data illustrate the “profound limitations of Darwinism”, but the reasons for this feeling are completely obscure.

Overall this Chapter provides a good example of the lengths to which someone will go if they start with the basic assumption (derived from their reading of Scripture) that evolution cannot possibly be true. This means that

however overwhelming the scientific data for common descent may be (which it of course is), then it has to be “explained away” in some way at whatever cost, even if this involves picking atypical data as if they were representative, or confusing the reader with irrelevant data, or even just deploying straightforward misinformation. This is not what Christians in science should be doing. Surely Christians of all people should be telling the truth about God’s world, but I am afraid that this is not what this chapter is trying to do.

It is also very striking that in this chapter as in all the other chapters of the book, no attempt is made to proffer any alternative scientific theories to explain the data that are discussed. This is pretty obviously because other alternative better explanations simply do not exist. All that’s attempted here is to poke holes in data supporting evolutionary theory, but the attempt is so poorly carried out that all one can say is that the data undergirding evolution comes out looking even more convincing! But that may not be the case for the general reader who has no access to the specialist literature, and might not understand it either even if they did. This Chapter is a flawed guide for the general reader.

### **Chapter 11 The Origin of Life: Scientists Play Dice**

This chapter points out that the origin of life is a difficult subject, which I think we already know. The author makes no attempt to engage with the arguments and data presented in *Creation or Evolution*, particularly in Chapters 14-16, so I do not have much to comment on here.

It is, however, of interest, that the author peppers his account with references to ‘naturalistic’ explanations for things. Given that the author is a chemist and a Christian, presumably he does not think that his own papers on chemistry represent ‘naturalistic’ explanations for the processes of the world, but rather sees them as descriptions of certain aspects of God’s created order. Presumably the author also sees his scientific descriptions, and those of others, as describing God’s work in creation even if those papers were published decades, or perhaps even centuries ago. It is therefore not clear why the author would not also want to see God’s bringing into being of the first life as also potentially describable through the language and concepts of chemistry (plus some other disciplines of course). What’s the difference?

Instead we are faced with a stark choice between ‘naturalistic explanations’ and the first chapters of Genesis. But why not develop a more orthodox and traditional view of creation theology which sees the whole created order as reflecting God’s mind and his intelligent design? The author of this Chapter might wish to reflect more on the writings on creation of authors such as Augustine, Basil, William of Conches and Aquinas.

### **CONCLUSION: Should Christians Embrace Evolution?**

This is the altar-call chapter in which Christians are called to forsake evolution and embrace the true path of young earth creationism (or it seems to be YEC for the most part, the authors seem to be a bit coy on this point – I suspect that they disagree amongst themselves on the age of the earth).

**p. 212** We find the usual reference to those “prominent evolutionists and scientists” who “question the concept of Darwinism”, but without any citation or indication of who this impressive list might be. Many creationist organisations (plus the Discovery Institute) actually publish lists of names, but when they have been looked at closely they simply don’t stand up to the claims of “prominent anti-Darwinians” that are made for them.

**p. 213.** If one is simply claiming that the current neo-Darwinian synthesis is incomplete, then let us certainly hope so. Theories are always being adjusted and improved with the passage of time. That’s why scientific theories have often been likened to maps – maps get better as new data come along and are incorporated in the new version of the map. Generally theories are not discarded completely, but rather adjusted to incorporate the new data. Of course this happened when natural selection was combined with genetics in the 1920s and 1930s to generate the neo-Darwinian synthesis.

**p. 215** The claim is made that all the authors of the volume have a “high view of science”. To be honest this is not at all apparent from what is actually written, for reasons that I hope will be clear from the above. A lot of the science in this book is just wrong, and when it’s not actually wrong, then it’s presented in a way that is often misleading. That does not support the claim made here that the authors have a “high view of science”.

**p. 216.** The claim is made that the chromosomal and other differences between the human and chimpanzee genomes do not support common ancestry, but as we have already noted, the chapters that tried to critique these data are deeply flawed. Furthermore, no alternative scientific models are presented to explain the observed data.

**p. 216.** Likewise the assertion that “recent research” has now “reversed previous scientific thought” and shown that many DNA sequences have functions and so can no longer be used in tracking evolutionary lineages, is irrelevant for the reasons explained above. The fact that some sequences have been shown to have functions not previously realized is neither here nor there, and doesn’t undermine the fact that there are thousands of pseudogenes, transposable elements and retroviral insertions that can only be explained by the fact of our common descent from the apes. Nobody involved in the ENCODE project (not least Francis Collins!) thinks otherwise, so to provide ref 14 as a supporting citation at this point is simply misleading.

**p. 217.** The authors’ comment that “natural selection directed by God is not natural selection” does, I think, reveal at this point a severely defective doctrine of creation. Surely the whole created order is brought into being and sustained by God. This is what we mean when we refer to God as Creator. So the whole created order is surely in a sense “directed” by God – biblical passages like Psalm 104 make that pretty clear. So if natural selection is our best human explanation for understanding many aspects of biological diversity, as indeed it is, then we are not talking here about anything that lies outside of God’s sovereign creative plan and control. Even many of my YEC friends believe that there has been very rapid diversification by natural selection within ‘kinds’ over the past 10,000 years to explain how so much biological variation could be derived so quickly from the originally created kinds. I don’t think they would see this rapid burst of natural selection as somehow not being part of God’s handiwork.

**p. 217.** The point is suggested that since Darwin himself did not accept “any idea of divine design in natural selection”, therefore his theory should be rejected. But this is a poor argument. I do not appreciate the work of Brahms any the less because I know that he was an atheist. Darwin was of course never an atheist, but surely all truth is God’s truth irrespective of its source. We should once again heed the fine words of the Calvinist poet Johan de Brune already quoted above: 'Wheresoever Truth may be, were it in a Turk or Tatar, it must be cherished...let us seek the honeycomb even within the lion's mouth'. Given that these words were written when the Turks were at the gates of Vienna, I think they are quite remarkable!

**p. 217.** The authors worry about the possible future evolution of humanity. As mentioned above already, evolutionary biologists are generally agreed that significant evolutionary change in humans is unlikely to occur, and the reasons for this are provided in *Creation or Evolution* Chapter 10 in some detail.

**pp. 217-218.** Under the heading ‘The Heart of the Matter’ there is a very significant misrepresentation of the data presented in *Creation or Evolution*. The authors make some very bold assertions claiming that new genes, new information etc does not arise in the evolutionary process. The authors seem not to have noted that *Creation or Evolution* spends pp 112-119 expounding this point (under the sub-heading ‘Where Does New Information Come From?’). The authors are just plain wrong in their assertion at this juncture.

**p. 219.** The claim is made at the top that the strongest evidence for evolution that has been made for evolution in the past 150 years is based on Darwin’s finches. Sorry, but that claim really is utter nonsense!



