Evolution: Still a Theory in Crisis

By Michael Denton, Discovery Institute Press, 2016

(358 pages with index, Kindle edition available)

A review by Will Jones

Michael Denton is a biochemist who has some questions for Darwinian evolution. Many of those who work in the field of evolutionary developmental biology, he notes, have started to question whether Darwin's theory really does hold all the answers for the traits they are studying. There is no doubt, of course, about natural selection, or common descent over millions of years, or the progressive emergence of higher and more complex forms of life. Those are beyond question. But Darwin's explanation for how the novel characteristics of organisms emerge – gradually, through numerous slight successive beneficial adaptations – is very specific, and may not provide the best explanation for many of the most important characteristics of biological life.

In particular there are the homologs, says Denton – the traits shared by all the members of a particular biological group which define them as belonging to that group, the "taxa-defining novelties" which underpin the schema of the great tree of life. Examples include hair, feathers, the pentadactyl limb, the diaphragm, and many more.

There are three problems with a classical Darwinian explanation for these traits, says Denton, a British-Australian biochemist and author of the influential 1985 book Evolution: A Theory in Crisis, to which the present book is a follow-up. The first is the lack of transitional forms present in the fossil record to show the development of the traits from more primitive forms – at their first appearance they are already the finished product. This might just be attributable to awful luck with the fossil record, but then there is the second problem: for many of them, such as the pentadactyl limb, which is common to all tetrapods, the precise structure of it (three bones and five digits) serves no specific adaptive purpose, so that it is not even clear why the finished product would be selected, let alone the elusive steps leading up to it. Furthermore, and this is the third problem, these traits have been conserved inviolate, some of them for over 400 million years. Indeed, it is because they have been conserved that they define the taxa and other groups, demarcating remarkably clear boundaries between unchanging subgroups. Some have even appeared multiple times independently over evolutionary history. Where then did they come from, these non-adaptive traits with no natural history – no lead-up to them, and no move away from them, these fixed points in the emerging tableau of life? Darwin's mechanism, effective though it clearly

is for bringing organisms into greater affinity with their environment, offers no hope for an answer here.

Denton is a proponent of Intelligent Design, but he has no interest in exploring ideas of special creation or divine intervention, not least because he describes himself as an agnostic. These are natural phenomena he is studying and he is only interested in a natural solution. He finds his answer in the great Victorian biologist Richard Owen, the founder of London's Natural History Museum, whose rival structuralist account of biology to Darwin's functionalist account Denton believes holds out hope for an alternative and more convincing explanation for the remarkable patterns and homologies of nature.

The key to this approach is the concept of natural law coupled with the idea of the fine-tuned cosmos – fine-tuned in both the universal constants and in the operation of the laws of nature. This fine-tuning means that life, and indeed life as we know it, is not just made possible by the way the universe is structured, but all but inevitable and necessary. The homological traits, Denton contends, reflect the operation of the laws of nature on biological matter in a way precisely analogous to the way the ordered array of atoms and crystals reflects the operation of the laws of nature on subatomic and atomic particles. The homologies appear, and they stick around, because of forces internal to matter which predispose them to form and to hold together over vast periods of time. These forces limit in myriad ways the permissible patterns which matter can adopt, and so force its hand towards those which serve to facilitate and constitute life.

That's why organs know their morphology – their shape isn't in their genes, as geneticists are now increasingly realising, but overwhelmingly epigenetic. It is also why proteins know how to fold down to their lowest energy state without tying themselves in knots. And it is why so much of biological matter exhibits such a remarkable degree of self-organisation and self-assembly, without any need for external input or evidence of genetic coding. It is, then, not just evolutionary development that would be explained by this structuralist thesis: it would unify ordinary biology with evolutionary biology under a single natural law based framework which would place biological science on the same solid ontological footing as the other natural sciences. This, for Denton, is one of its great attractions.

Where would this leave Darwinism? It wouldn't invalidate it of course – that is impossible. Darwinian natural selection obviously occurs, for the environmental constraints of fitness will always result in adaptations arising from successive instances of natural variation. What it would do, though, is relegate it to a supporting role – an "adaptive mask" as Denton calls it, citing Owen, over the more fundamental "primal patterns" which undergird the tree of life and hold it together over the aeons.

Denton is helpfully candid in the book about the possible theological implications of the thesis, but is keen to play down their significance and focus on finding the best account of the empirical data – a reflection,

perhaps, of his own agnosticism. He isn't in this to push a particular doctrinal agenda but to follow the facts.

I found this book an accessible explanation of an ambitious, yet undeniably attractive thesis – though it could, I feel, have been made more accessible through being more careful with its use of technical terminology, using warnings and distinguishing technical and non-technical sections, as is common in popular science books these days. Some sections, particularly early on, felt a little close to the polemical, and the whole book would have benefited from some rationalisation to avoid repeating itself too much, and to ensure that key points were made in their clearest and most arresting form. Personally, I would have liked to have seen something on the possible meaning of the thesis for the existence and character of extra-terrestrial life, which seemed to me an obvious big implication. But these are just quibbles.

Overall, this book represents a bold attempt to present the alternative framework to Darwinian evolution that is it seems so lacking in current biological debate and might well explain the data better. Even if you find yourself disagreeing with Denton's arguments and conclusions, you will benefit from having read and considered this book, for evolutionary biology is currently a discipline in flux, and this sets out the problems well and takes a decent shot at a solution.

Will Jones is a mathematics graduate with a PhD in philosophy who is involved with two social theology projects in the UK.