

Was
Darwin
Wrong?

Evolution: a theory in crisis?

a review by Gert Korthof

26 Oct 1997 (updated: 29 July 2005)

This review consists of a [summary](#), [criticism](#) and [conclusion](#) of this now classic book. At first the title of this book withheld me from buying it. Crisis? I studied biology and specialised in genetics and evolution, but I never heard of a crisis in Darwinism. Yes, I noticed problems and controversies, the theory was incomplete, but crisis? Now I've got the book from a friend (1) and I read it. Criticism of the fundamentals of Darwinism was not part of my biological training. But once I had gone through the 'This-must-be-a-big-misunderstanding' phase and had learned to use the non-evolution paradigm, it became suddenly possible to read the standard evolutionary publications in a new, critical way. This is hard or even impossible *within* the Darwinian paradigm. This is the attitude Feyerabend probably had in mind when he wrote:

"The first step in our criticism of customary concepts is to step outside the circle and either to invent a new conceptual system or import such a system from outside science, from religion, from mythology." (6)

One does not need to agree with the non-evolution paradigm to gain new and deeper insights into neo-Darwinian theory. It is also scientifically valuable, since there is no science without critical attitude towards data and theories. I even claim that one cannot understand neo-Darwinism fully without reading Denton's book. Denton did spell out certain implications of Darwinism in greater detail than my teachers and textbooks did. *Evolution: a theory in crisis* is the work of a scientific dissident. It is a non-religious work. The book is neither free from scientific errors (12) nor free of bias. **Because of the errors and the bias, I cannot recommend it to those with little biological training, unless endowed with a sound critical attitude. Especially since Denton adopts the evolutionary view of life in [Nature's Destiny](#) (7).**



"Evolution: a theory in crisis."

by **Michael Denton**
Adler & Adler, 1986.
368 pages.
Hard cover.
With illustrations

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A 2nd edition (dec 1996) paperback reprint was published by Adler & Adler Pub., ISBN: 091756152X .

Genesis Rejected

Since Aristotle biologists believed in the fixity of species. Because Aristotle's philosophy had been the official doctrine of the church and the fixity of species was in harmony with Genesis there did not exist any conflict between science and religion or church. Nearly all biologists and geologists at that time accepted innumerable miraculous or supernatural events. However there was also a considerable degree of empirical support in the form of true breeding species and lack of intermediates: the facts that made Linnaeus' classification system possible and the facts of anatomy (Cuvier) which revealed that organisms could not be transformed into each other easily.

The Theory of Evolution

Denton gives a good presentation of what the theory of evolution is and what the positive evidence is. He even presents Darwin as a cautious and integer scientist. However he could not resist the temptation to mix criticism and description of Darwin's theory. The reader should be aware that Denton uses the distinctions 'special theory'- 'general theory' and 'microevolution'-'macroevolution', which are not Darwin's own words and cause a biased description of Darwin's theory. According to Denton, the **special** theory is relatively conservative and *restricted* in scope and *merely* proposes that new races and species arise in nature by the agency of natural selection. The **general** theory is far more radical. It makes the claim that the 'special theory' applies universally and that the appearance of all manifold diversity of life on Earth can be explained by a simple extrapolation of the processes which bring about relatively *trivial* changes such as those seen on the Galapagos Islands (p44, italics are mine). The distinction micro/macro is associated with limits on change. Darwin himself saw no limits. For Denton these distinctions are crucial, as will become more and more clear in later chapters.

From Darwin to Dogma

In From Darwin to Dogma Denton describes the acceptance by the scientific community of evolution by natural selection as a dramatic overthrow of one particular interpretation of nature by an entirely antithetical theory. The facts were the same, the perception of them had changed. It is important to note that according to Denton, Darwin in 1859 had neither direct evidence of speciation in nature, nor evidence that natural selection caused any change in nature, nor an 'infinite of connecting links'. Yet despite the weakness of the evidence, Darwin's theory was elevated from a speculative hypothesis into an unchallenged dogma, according to Denton. Denton describes it as an almost arbitrary psychological switch and at the same time he knows that "Darwin was extending the scientific method to the biological sciences by giving a natural explanation of the design of living things." (p71) Keywords are : uniformitarianism, continuity, gradualism. It is important to remark that notwithstanding Denton's understanding of why the Darwinian revolution must have happened, he maintains that the evidence was insufficient. This theme we find again in Johnson (1993).

A Partial Truth

In A Partial Truth Denton presents impressive and convincing evidence for the reality of speciation and natural selection in nature. [In fact so convincing that creationist-followers today accept microevolution almost by default!.] No need to worry. The zoologist Rensch compiled a long list of leading authorities who have been inclined to the view that macroevolution cannot be explained in terms of microevolutionary processes. Denton tries to illustrate **limits of change** with the example of transformations of words and sentences in natural languages. Summary: Microevolution? Yes! Macroevolution? No ! It's clear now why Denton needs the distinction.

The Typological Perception of Nature

In The Typological Perception of Nature Denton shows that variation in nature is around a 'type'. 'Basic types' or 'basic design' is invariant. He points to structures like cilia, mammalian hair and genetic code. Classes of organisms (not at the species level) are absolutely distinct and that the diagnostic characteristics are present in invariant form. Keywords: invariant, abrupt, discontinuity, typological. The 'typologists' (Linnaeus, Agassiz, Cuvier) did not retreat from empiricism, it was Darwin who retreated from empiricism, according to Denton.

Systema Naturae from Aristotle to Cladistics

In Systema Naturae Denton describes **biological classification** systems from Aristotle to Cladistics in a way accessible to nonbiologists. On page 132 he admits that the hierarchic nature of the classification system is very suggestive of some sort of evolutionary tree. On page 137 he informs us that the hierarchy suggests typology and not evolution. Cladistics is an evolution-free description of nature's diversity (8).

Failure of homology

In Failure of homology Denton shows, mainly based upon 'Homology, an Unresolved Problem' (1971) of Sir Gavin de Beer, that homologous structures need not be controlled by identical genes and homology of phenotypes does not imply similarity of genotype. Which is new to me. Denton concludes that the evolutionary interpretation of homology breaks down. Since homology is the *raison d'être* of evolution theory, there is little need for the theory of descent with modification. I would comment: what else can one do than explaining diversity with unity (common descent). Explaining life's diversity by independent creation would be equal to explaining diversity by diversity.

The Fossil Record

The shortest possible summary of this chapter is: intermediates have not been found because they **never existed** ! Only someone like Denton can *think* this, and interpret the data accordingly. That is what he does in this chapter on the age-old problem of the missing links in the fossil record.

Bridging the Gaps

Denton shows us the gaps : the origin of birds, the origin of feathers, the origin of bats and whales, reptiles, the mating flight of the dragonfly, the life history of parasites, interspecies altruism, the rotary motor of the bacterial flagellum, pollination of orchids.

The Enigma of Life's Origin

The discovery of extraterrestrial life would be powerful circumstantial evidence for the evolution of life on our own planet by perfectly natural processes, says Denton. But it has not been detected. However if life on Earth is unique, it cannot be a subject of scientific investigation, because science deals only with repeatable events. There is no evidence in sedimentary rocks of the famous 'prebiotic soup', contrary to the general opinion that it is an established fact. Especially the origin of translational systems is insoluble. So the origin of life is an intractable problem.

A Biochemical Echo of Typology

The key to this chapter is Denton's definition of evolutionary relationships: that protein sequences (Cytochrome C, Haemoglobin) can be **arranged into an evolutionary series**. (That is protein sequences of **living** species of course.) If it is impossible to find intermediates, it counts against evolution. And indeed Denton does not find intermediate cytochromes. And there are no intermediate haemoglobins. There are no proteins "ancestral" or "primitive" or "advanced". The only way to explain the molecular data is by the molecular clock hypothesis. Which is dismissed as a tautology by Denton. As is the functional constraints hypothesis. Above this Denton holds that the molecular clock cannot be explained by both the neutralist and the selectionist model.

Beyond the Reach of Chance

It is surely a little premature to claim that random processes could have assembled mosquitoes and elephants when we still have to determine the actual probability of the discovery by chance of one single functional protein molecule! An important chapter.

The Puzzle of Perfection

This chapter could be named **Paley's Puzzle of Perfection**, because it argues anew for Paley's Perfect Design. The reason Paley's argument from analogy is again valid today, is the depth of the machine-organism analogy, which has been revealed in the last decade of biochemical research. And there can be nothing logically inconsistent, as Paley would have argued, in extending the usefulness of the analogy to include an explanation for their origin.

The Priority of the Paradigm

Darwinists produced evidence for micro-evolution, not available to Darwin, but failed to provide evidence for macro-evolution. The failure to produce evidence for macro-evolution is simply caused by the fact of the discontinuity of nature, the reality of gaps in nature. But being convinced of the continuity of nature, biologists neglected or explained away discontinuity in the living world and in the past. Secondly the all-sufficiency of pure chance as the creative agency of evolution has never been proved. Notwithstanding these disproofs, Darwinism continues to be mainstream science because of the Priority of the Paradigm: there is simply no scientific alternative theory. Above that the Darwinian worldview satisfies the same deep psychological need for an all embracing explanation for the origin of the world, which has also motivated all cosmogenic myth makers of the past!

Criticism :

1. [The 'Typological Model' \(TM\) does not hold at the species level](#)
2. [Denton has no explanation for his 'Typological Model' of nature](#)
3. [Cytochrome of 'primitive' living animals did not freeze](#)
4. [The Argument from Design is based upon materialism and naturalism](#)
5. [Fundamental difference between organisms and artefacts destroys watchmaker analogy](#)

The 'Typological Model' (TM) does not hold at the species level

Denton is consistent in that he accepts micro-evolution (evolution at the species level) and the standard Darwinian explanation for **the origin of species** and at the same time holds that the 'Typological Model' does not apply at the species level. It is clear that acceptance of micro-evolution necessarily excludes TM at the species level. For if gradations of intermediates between species exist, then the idea that species are isolated groups with unchanging essential characteristics is wrong. It is embarrassing that exactly in the domain of living species TM fails. The living species are the basis of the grand biological classification scheme. The level where evolutionary evidence is best. There must be something wrong with the very idea behind typology! Although Denton mentions the failure of TM at the species level only once (p105), it has great consequences: the Typological Model (TM) fails to describe adequately the classification of living species in nature, notwithstanding the fact that not *all* living species form a continuum (there are gaps). But there are more consequences: if Denton accepts the Darwinist non-typological **explanation** for the lack of distinct species borders, how does he escape extrapolation to higher taxonomic levels: that is macro-evolution? I have no problem accepting that TM does apply to the abstract above-species- classification-levels of genera, families, classes, orders and phyla. At those levels gaps are magnified: they are far greater than between species. [Imagine that if at those levels a gapless nature is demanded, thousandfold more species were forced to live together with the now existing species, side by side. There would be no ecological place on the planet earth for that amount of species].

Denton has no explanation for his 'Typological Model' of nature.

Now, granted that TM is right as a description of the above-species level (the higher taxa), does it **explain** what it describes correctly?

- If Denton accepts the age of the earth and
- if he accepts the chronological sequence of appearance of organisms in the geological record and
- if he accepts that intermediates (above the species level) do not exist,
- then how did new species originate ?

This is by no means explained by typology! Isn't it amazing that typologists draw trees with *hypothetical common ancestors* ? On page 132 Denton even admits that "**the hierarchy is very suggestive of some sort of evolutionary tree**". The only difference with the Darwinist interpretation being that Typological trees and their common ancestors are abstract and theoretical. Darwin made one step further: if the tree is real and ancestors are real then they do explain the tree !

On the other hand the only theoretical background of typology is essentialism, the Linnean fixity of species and independent creation of species! The theory behind typology is 'metaphysical nonsense', according to Denton (p117).

Denton can describe discontinuity in fossils, living organisms, proteins and DNA as confirming to the 'Typological Model' and his description is very close to observations. That is a good thing in science. But science without theories is only a descriptive activity. Clearly closeness to empirical reality is an important but not the *only* criterion by which we judge theories. Otherwise we would have to choose Aristotle and that is not exactly progress in science ! (p290).

Cytochrome of 'primitive' living animals did not freeze

For Denton a demonstration of evolution in proteins is a demonstration that protein-sequences can be arranged in a series of intermediates. He found a dramatic absence of intermediates when comparing the cytochrome C2 of all eucaryotic organisms with bacteria. (2) They all differ 64%-72% with bacteria. He concludes: no eucaryotic cytochrome is closer to bacterial cytochrome than any other. No intermediates. No primitive or advanced. However he fails to point out that necessarily only **living** species are described. And because they are living now, their proteins are copied from generation to generation and mutations accumulated. Cytochromes of living organisms, how morphologically primitive they may be, are not intermediar, because now living organisms do not have ancestor-descendant relationships. All are descendants. The only place to look for intermediates is in history, in geology. Of course there is not a trace of the traditional evolutionary series: cyclostome -> fish -> amphibian -> reptile -> mammal when looking at the molecular level, because we are looking only at living descendants ! All vertebrates have the same molecular distance to all invertebrates, because their ancestors separated only once. Equally all eucaryotes have in common that their ancestor split at the same time from bacteria. The molecular distance of any group to any other group is of course a measure of time elapsed since their separation. Denton knows that no evolutionist has ever claimed that any of the **living** representatives of any vertebrate class is directly ancestral with respect to another vertebrate group (p293). So: **who** is Denton attacking ? He knows that the only way to explain the cytochrome data in evolutionary terms is to propose that cytochrome has continued to evolve in each of the lines at its own characteristic uniform rate with respect to absolute astronomical time (p294,295) in other words: the molecular clock hypothesis. The molecular clock hypothesis is a tautology according to Denton. He does not know however that the hypothesis can be independently tested by using a *known* phylogeny (3). Readers should be aware of the fact that the field of molecular evolution is a fast developing field and should not expect that Denton's description of more than 10 years old gives an up to date description of the field (12).

I wrote an up-to-date critique of Denton's cytochrome argument in my review of biochemist [Christian Schwabe's book](#) (2).

The Argument from Design is based upon materialism and naturalism

The argument from Design as stated by **Paley** runs: since there is a strong analogy between human devices and organisms, one can conclude from the existence of the human designer, to the existence of the designer of organisms. Denton reinforces the analogy by stating that for the purpose of description living things are machines and that the analogy is a deep analogy (p341). The point that should worry religious people is that the analogy has extreme materialistic and naturalistic assumptions. A necessary condition for the analogy is that humans and all other living beings must be machine-like enough to justify the analogy. Here a dilemma emerges. On the one hand the deeper the analogy between machines and humans, the stronger the design analogy argument, but at the same time the more machine-like humans are, the less room for consciousness, a soul, life after death, etc. Machines don't have souls and a life after death, do they? Doesn't that invalidate the analogy in a profound way? Furthermore since insects are more machine-like than humans, does that imply that it is more certain that insects are designed, than humans? Creationists like Johnson are writing several books to attack naturalism and materialism, and Denton makes naturalism the fundament of the design argument! If humans are machines after all, why fight against materialism?

Relevant difference between organisms and artefacts destroys analogy



Organisms and watches are similar because both are complex and have many co-operating parts. But they differ also in many ways. For example watches are made of glass and metal, and organisms are not. This is not a relevant difference. Relevant for the validity of Paley's analogy are properties bearing on the questions 'Where did this object come from?' or 'How was it produced?'. The following properties are relevant for the validity of the watchmaker analogy:

1. Watches don't reproduce
2. Watches don't have heredity
3. Watches don't have mutations

Typical for artefacts, a watch is produced from raw materials by **external** forces. Watches don't self-assemble. Watches don't descend from other watches. There are no father and mother watches, no baby watches. Every single watch we encounter is necessarily produced by external forces because watches are unable to reproduce themselves. No wonder watches need a watchmaker!

We know today that organisms reproduce and self-assemble on the basis of **internal** information (DNA). Watches don't have internal self-descriptive hereditary information. The instructions to manufacture a watch are located outside the watch, which explains why they cannot reproduce themselves. The properties reproduction and heredity suggest how living individuals come into existence. This is not a superficial difference, but a fundamental difference (9). Living organisms do not need external help from a 'organism-maker' for their construction, because they have internal information to do just that.

Evolution is more powerful design

To my surprise Paley considered designed, self-reproducing watches (10) and concluded that his design inference was reinforced. So this is a second version of his design argument. He was right that self-reproducing watches are a more powerful design. And he was right that self-reproduction is not an 'ultimate' explanation, because self-reproduction was designed by the watchmaker and not by the watch itself. Now my point is that **if** self-reproducing watches are a more powerful design strategy, then creating the first form of life and let it evolve into all the million of species, is certainly a far more powerful design method. Furthermore, designing the laws of nature and creating the initial conditions of the Big Bang must be the most powerful creation method. Paley wrote his book before Darwin's Origin of Species. If he had known about natural selection, then only the religious dogma of the fixity of species (biblical 'special creation') could prevent that one species could originate from another species. And the whole point of his analogy was to prove a Designer without relying on revealed religious knowledge (11). Following his own logic, Paley could have been a theistic evolutionist if he had known Darwinism.

Conclusion
[updated: 29 July 2005]

Michael Denton often is called a creationist. The title of the first Chapter of his book is: "Genesis Rejected", but the chapter contains a historical account, not a defence of Genesis. It is true that Denton accepts Paley's argument from design. This is a philosophical argument for the existence of a supernatural designer. But it is also a 'natural theology' in the tradition of Paley. Since Denton rejects (macro)evolution and his own Typological Model does not explain the origin of species, he needs an answer. Paley has given him the answer. This is a nonscientific answer because both philosophy and natural theology are outside the natural sciences. With hindsight, Michael Denton could be called the first 'Intelligent Design Theorist' (5). Denton must be aware that Paley's answer is outside since, because:
"Undoubtedly, one of the major factors which contribute to the immense appeal of the Darwinian framework is that, with all its deficiencies, the Darwinian model is still the only model of evolution ever proposed which invokes well-understood physical and natural processes as the causal agencies of evolutionary change." (p355).

Notes:

1. This book was a gift from Dr Sid King.
2. Christian Schwabe, a chemist, used Denton's cytochrome-C illustration (without acknowledging the source). See [review](#) on this site. [March 2002]
3. Atchley, W.R. and W.M. Fitch. *Gene trees and the origin of inbred strains of mice*. Science 254 (1991):554-558 quoted by Roger Lewin(1997) *Patterns in evolution. The New Molecular View*. This is a popular-scientific account of molecular evolution (246 pages).
4. Mark Ridley (1996) *Evolution*. Second edition. Blackwell Science, Inc. page 178. This is an excellent up-to-date overview of current evolutionary biology (719 pages).
5. *Darwin on Trial* appeared 5 years after *Crisis*. [Denton's opinion](#) about the creationist Phillip Johnson: "Darwin on Trial is unquestionably the best critique of Darwinism I have ever read. Professor Johnson combines a broad knowledge of biology with the incisive logic of a leading legal scholar to deliver a brilliant and devastating attack on the whole edifice of Darwinian belief. There is no doubt that this book will prove a severe embarrassment to the Darwinian establishment." This is a very polite statement because I later found out how strongly Johnson himself was influenced by Denton's book: "Among the readers strongly influenced by the book was Phillip Johnson, who while on sabbatical in England read *Evolution A Theory in Crisis* (...), and Michael Behe, both of whom found the book revelatory." ([Origins & Design 19:2](#)).
6. Paul Feyerabend, *Against Method*, third impr. 1976, page 68.
7. [review of Nature's Destiny](#) (1998) on this site.
8. However evolution is an *assumption* in current cladistics! See [review](#) on this site.
9. In discussing the biological species concept Ernst Mayr(1982) notes that a species is not "a class of objects" and that the biological species concept is inapplicable to species of inanimate objects (*The Growth of Biological Thought*, p272).
10. William Paley(1802): Natural Theology, in: *Philosophy of Biology*,1998, edited by Michael Ruse, pp36-40. See also Richard Lenski(2001): "Twice as natural", concepts, *Nature*, **414** 255, 15 Nov 2001.
11. A second fact Paley overlooked is that the miraculous complexity of an adult human being is not created out of nothing, but develops from a single cell. And since Paley does not want to invoke supernatural intervention in his argument, this growth of complexity must be natural as well. It is so beautifully described by Enrico Coen: "How organisms make themselves". These crucial and relevant dissimilarities destroy the suitability of Paley's watch/organism analogy. In fact Paley's argument is a complexity argument. It says "complexity is enough to infer design". Remarkably William Dembski's main argument is also a complexity argument (mathematical complexity) and Michael Behe's main argument is a complexity argument too (biochemical complexity). Both are modern versions of Paley's argument! A better analogy would be comparing life with 'Artificial Life' (reproducing and evolving software objects). Only with the question 'Could a designer construct self-assembling and self-reproducing objects with heredity and mutation?', the discussion starts to become really interesting. See for artificial 'self-assembling' systems: Phillip Ball "It all falls into place..." *Nature* **413**, 667-668 (2001).
12. Finally there is a good and clear discussion of Denton's ideas in print: two biologists refute Denton's typological theory: Matthew J. Brauer and Daniel R. Brumbaugh: *Biology Remystified: The Scientific Claims of the New Creationists*, p308-314 of Pennock(2002) *Intelligent Design Creationism and its Critics*.

Links:

- [review of Denton's Nature's Destiny](#) (1998) on this site.
- [Discussion of several of Denton's claims](#) by Douglas Theobald, Ph.D. [Updated on March 21, 2002]
- Michael J. Denton, Peter K. Dearden, Stephen J. Sowerby (2003) "**Physical law not natural selection as the major determinant of biological complexity in the subcellular realm: new support for the pre-Darwinian conception of evolution by natural law.**", [Biosystems](#), Vol 71, Issue 3, October 2003, pages 297-303. [Abstract](#).

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