# The Limits of Natural Selection

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## Introduction

Natural selection is grounded in genetic change; it depends on spontaneous mutation, which gives rise to something new that could be advantageous in survival; and it is modulated by the environment.[1] Our task is to understand what is philosophical in this definition and to show why a mechanism of natural selection is not inimical to the doctrine of creation. Our case is that natural selection is consistent with an old earth creationist[2] reading of Genesis and also a fairly literal reading of the creation account.

In this article we have no quarrel with natural selection being grounded in genetic change; this is all about hereditary information and the use to which that information is put; we are interested in what it means for a mutation to be 'spontaneous' and whether this concept is compatible with divine agency. We are also interested in analysing the 'coincidence' of there being an environment that could modulate change.

There is also a philosophical question about the use of the idea of 'selection'. Obviously, we have no difficulty understanding intelligent life selecting purposefully, but what, we may ask, is doing the selecting in a scheme of natural selection? If there is figurative understanding at the heart of the theory of evolution, is that scientific or philosophical, and is it anthropomorphic? It is possible that there is some equivalence in explanatory power between the ideas of evolution and divine creation if the idea of natural selection is anthropomorphic.

## Defining Natural Selection

Natural selection is easy to understand in terms of the survival of the fittest. The 'selection' is all about being selected 'for life'. If a change in an organism is more advantageous to its survival in an environment, the change will more likely be perpetuated because the organism is more likely to live long enough to have progeny. Contrawise, if a change was detrimental to survival, the change is less likely to be perpetuated.

In the limiting case of a single unchanging environment, natural selection will operate and account for development in an organism. The diversification in the organism is limited by there being one unchanging environment. With multiple changing environments, diversification will be increased. The natural reality that there is 'selection in life' explains the degree of fit to an environment that we see in an organism. Features have been selected over time and the ensuing 'correlation' and 'fit' to the environment amounts to an *appearance* of having been designed for the environment.

We come to understand natural selection through familiar examples like peppered moths and their colours, the beaks of finches changing, bacteria developing resistance to antibiotics, the breeding of animals, and the engineering of crops. Natural selection doesn't have to have had an effect with all changes. Differential reproduction may be working to the advantage of one type of organism, but changes might be occurring in that organism unrelated to its success; these may be carried along.

Natural selection is a descriptive explanation of what has happened and what is 'going on' in nature, but as a principle, it fits *any* data that nature offers to the biologist. It doesn't explain why we have this feature rather than that; this is because natural selection both selects 'in' and selects 'out'—all features come within its compass. The explanatory work is done when we describe the environment and the characteristics of the feature itself—bringing them together in a relation. Natural selection purports only to explain why there is the appearance of design, but not the origin of any particular 'design'.

However, natural selection does not account for the appearance of design in those features of an organism unrelated to environmental survival. We can hardly appeal to the selective power of the environment in respect of differential reproduction if the changes are not related to the environment in which reproductive survival is modulated. It is simple enough to explain adaptations when we can see the

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[1] F. J. Ayala, *Darwin's Gift to Science and Religion* (Washington DC: Joseph Henry Press, 2007), 8.

[2] See A. Perry, *Old Earth Creationism* (Sunderland: Willow Publications, 2012).

plant or animal, and even the bacterium, in an environment; it is less obvious how the principle of natural selection is applicable in cell biology.

Of course, with environmental changes over time, maybe there have been environments where features of an organism were once useful. Maybe the changes to an organism that would eliminate environmentally irrelevant features have not taken place yet. This supposition is necessary to bolster the comprehensive ambition of natural selection. We are going to have to hypothesize about various environments in the past to account for what are now environmentally irrelevant features. What is the scientific status of these hypotheses—are they merely *ad hoc*? Why not say, instead, that environmentally redundant features are contrary evidence to natural selection?[3]

Further, we might ask: **must** all features of an organism be related solely to the environment and survival? Can an organism have or carry features that do not need an environmental rationale? Some features are necessary to survival but why should an organism not be capable of carrying environmentally irrelevant features? To pose this question is enough to reject the 'catch-all' status of natural selection. This is not particularly controversial.

In creationist terms, an example of the features of an organism that would be unrelated to an environment would be those that pertain **to Art**; features that add to the aesthetics of an organism, its beauty (or otherwise). While biologists do often relate beauty to function (e.g. colourful mating displays[4]), it requires an argument in aesthetics to subordinate all art to function. For example, at the molecular level, if within the DNA molecule there are non-functional nucleotide sequences, they still contribute to the beauty of the double-helix structure of DNA.

The point here is that it is a philosophical choice to insist that all features of an organic entity have an environmental and functional explanation in the past or the present; instead, it could be that some features have been *artificially* selected for beauty, i.e. through intelligent design.

**Mutations**

Genes come in pairs for each trait; each gene is segregated and one of the pair is inherited from each parent. Genes are specialized units of DNA molecules in the chromosomes of the nucleus of the cell. Genes retain their distinctiveness down the generations. The information encoded in the nucleotide sequence of the DNA molecule is large. We can think of it in terms of an analogy with the semantic information in a sequence of letters of the alphabet (ACGT) that is a book long. It is in the information of these sequences where mutations occur. Genes mutate and the cells that count for mutations are the sex cells; this is a random happening and they arise without regard to their effect for an organism's survival in an environment. The environment has a selective role on mutations such that beneficial changes are multiplied and less beneficial ones are eliminated, but the environment itself is just a random element of the picture.

We should pause to note the 'random' element. The mutation is random, which implies that a certain kind of explanation is not thought possible, i.e. a non-random explanation for a change is not thought possible. However randomness is explained in a deterministic world-view, there is here an opening for divine agency (again, subject to a resolution of the philosophical Problem of Determinism). However, it is important to note that the randomness of a particular change or an environment does not amount to the claim that natural selection itself is random.

With natural selection, changes that are beneficial to survival are selected and this is obviously not a random matter. Ayala observes,

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[3] P. E. Johnson, *Darwin in Trial* (3rd ed.; Downers Grove: Intervarsity Press, 2010), 50-51, observes that this is why natural selection is difficult to test.

[4] The peacock's display attracts a mate but the feathers are disadvantageous to survival; we might ask why the peahen has 'evolved' to require such a display that is injurious to her reproductive survival; see Johnson, *Darwin on Trial*, 51.

> …evolution is not the outcome of random processes. There is a "selecting" process that picks up adaptive combinations because these reproduce more effectively and thus come to prevail in populations.[5]

A process where there is a *control* element (survival) is not random. Moreover, beneficial changes will be accumulated leading to an increasing better fit with an environment. This principle is true for how long an environment lasts; changes to the environment obviously alter what is going on in evolutionary development.

As well as allowing for divine intervention for any specific 'spontaneous' change, we can also allow for such intervention to **configure and coordinate** the environment.[6] W. A. Dembski comments,

> To perform such coordination, evolution requires a substitute for a designer. Darwin's claim to fame was to propose natural selection as a designer substitute. But natural selection is no substitute for intelligent coordination. All natural selection does is narrow the variability of incidental change by weeding out the less fit. What's more, it acts on the spur of the moment, based solely on what the environment at present deems fit, and thus without any foresight of future possibilities. And yet this blind process, when coupled with another blind process (incidental change), is supposed to produce designs that exceed the capacities of any designers in our experience.[7]

There is, however, a further opening in our naturalistic framework for the divine. If natural selection is **not random** in itself because a principle of survival modulates changes, we should ask whether this can only be a feature of intelligent design. That is, is a system that has natural selection as a feature one that requires a creator? Is anything non-random therefore necessarily evidence of intelligence?

**Time-scales**

Evolution by natural selection is an incremental process. Referring to the old age of the earth is the strongest argument for there having been some evolution from a creationist point of view. Why is the earth old if **slow** natural processes are not part of its design? The Bible says nothing about pre-Adamic times and so whatever we want to say about creation and evolution in those times is a scientific matter with the philosophy of that science being informed by the example of creation that we do have in Scripture. Hence, pre-Adamic times do not exclude special creation, because we cannot exclude divine action throughout earth's history. Natural processes can be used by God, but he is not limited to them. They may go so far to explain variation and diversification in nature, but we cannot exclude such things as species creation and species development by divine action utilising common material and varying common design, i.e. actions that interrupt and take over the natural process. The natural process could only be a baseline upon which divine action takes place.

For example, take any hypothetical description of the evolution of a complex feature. Stepwise incremental development is postulated, but equally *compression* of the steps necessary to get from A to B is not illogical and cannot be excluded if there is a god who is a creator. The partially correlated phylogenies of the fossil record and the molecular biologist offer a punctuated picture, but it is the gaps between leafs on the tree that beg the question of how we know *what change is going on in the gaps*. That God is doing nothing in these gaps is as much a presumption as saying that it is *just* slow cumulative change that is going on in getting from A to B.

Suppose a million years separate A and B on a correlated phylogenetic tree, but that we have no intermediate evidence between A and B. The problem for our construction of knowledge here is not a

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5 Ayala, *Darwin's Gift*, 62.

6 *Contra* Ayala, *Darwin's Gift*, 71, "In evolution, there is no entity or person who is selecting adaptive combinations".

7 W. A. Dembski, "Introduction: The Myths of Darwinism" in *Uncommon Dissent* (ed. W. A. Dembski; Wilmington, Delaware: ISI Books, 2004), xvii-xxxvii (xxi).

lack of intermediate fossils;[8] the problem is how we exclude divine action that (from a naturalistic point of view) speeds up the incremental development and loads it towards B—for example, a divine utterance of the form 'Let the following base pair sequences in organism x be as follows…'. Such action may be supported by the punctuated nature of the fossil record.

**Probability**

A brief (non-mathematical) note on probability is needed at this point. While it is well understood that natural selection as a process is non-random and incrementally cumulative, and while the default speed is slow, creationists baulk at the 'probability' of *so many* adaptive changes coming about to produce complex features. What is the evidence that macro-evolution *can be* accomplished through natural selection? This is not asking whether macro-evolution *has been* accomplished; it is asking if our current knowledge of biological systems allows us to posit the evolution of such a thing as even a fly.

The adaptive changes to which evolutionists point in the laboratory seem small and very much of the 'now'. We live and conduct experiments on a small scale and on a short time-scale, so this is an obvious point. However, the challenge arising from this limitation is that we have no experimental evidence that large-scale macro-evolutionary change can take place. Hence, Dembski asserts, "large-scale evolutionary changes in which organisms gain novel, information-rich structures cannot legitimately be derived from the Darwinian selection mechanism".[9] Reading 'Popular Science' books on evolution and reading their descriptions of complex life-forms, it intuitively seems obvious that natural selection needs **oversight** and **intervention**. Can natural selection be a 'creative process' without a creator?

**Naturalism**

Natural selection can be (and often is) presented without regard to God. This choice in presentation is often termed 'Naturalism'. However, there are three steps to the presentation: the first step is to describe the basis of change (locate the mutations and affirm they are spontaneous), and then describe the natural non-random basis of the environmental selection. The third step is to claim that the first step is a sufficient explanation.

However, our counter-argument to this philosophy of naturalism is to supplement 'spontaneous change' with 'initiated change' and introduce concepts of 'oversight' and 'coordination' in relation to the environment into which change is introduced. This in effect denies the third step of the typical evolutionary presentation. It is not sufficient to run only with concepts of 'spontaneous change' and non-random selection—the intelligence implied by there being a non-random process in the first place allows us to further posit coordination of the environment, and, of course, this is supported by the example of Scripture.

The theory of evolution is often condemned as an atheistic naturalism, but this is unhelpful rhetoric. The *real* naturalism is to insist the change is 'spontaneous' and to disallow any co-ordination of the environment in respect of the changes. We can dub this 'metaphysical naturalism' while referring to the descriptive project of Science as 'methodological naturalism'. Methodological naturalism is the method that Science proceeds *as if* there is no God in its day-to-day work. If we maintain this distinction,[10] we can see that a successful scientific naturalism is possible and also likely because the philosophical layer of 'metaphysical' naturalism does no work in generating results.[11]

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[8] The time-scales are so big, discovering a missing link merely produces two more missing links either side of the new fossil.

[9] Dembski, "Introduction: The Myths of Darwinism", xxx.

[10] Critics of evolution often just talk of 'methodological naturalism' without making this distinction.

[11] When we affirm that God co-ordinates the environment and initiates change, we are not overturning natural selection; the co-ordinated environment is having the same naturally selective effect on changes. The *relations* in the theory of evolution remain intact.

There is a parity to observe in the choices here facing the natural philosopher.[12] It looks as if the choice between 'spontaneous change' and 'initiated change' has to be made on philosophical grounds. The question is: can spontaneity be 'seen' (where 'seen' covers all human observation)? Perhaps in quantum mechanics this can be seen, but if it cannot otherwise be seen, we might ask: can 'initiated' change be seen? Obviously, we see such change carried out by sentient animals (e.g. us), but can divine action be seen? This is certainly a philosophical question and the question is at the heart of the theory of evolution. The arguments in favour of a creationist view are those for the existence of God, coupled with the witness of Scripture (and not part of this article).

**Changes**

It is important to realise that natural selection is an explanatory framework which we apply to the change we are analysing. The environment itself is just the result of other changes, but we treat it as a passive element in our analysis of the 'evolutionary' change we are examining. For example, if we are analysing the camouflage changes in an animal, we may correlate these with a change in the environment or the predator population of its world. Equally, we could focus on the changes to the predator capabilities in that same environment of which the camouflaged animal is now considered a part. In short, what we take to be the 'environment' changes according to what we select as the change to be studied.

This means that change is ubiquitous—nothing is excluded from change, even if rates of change vary, with some organisms remaining static for aeons and other organisms changing at laboratory speed. The ubiquity of change means that the claim of 'spontaneity' is ubiquitous (as would be its alternative—'initiated change'). This may be obvious but the point is that the *quantity* of change to get to a given form of life on a phylogenetic tree is enormous for an atheistic evolutionist. An observation about just quantity doesn't draw in natural selection, so the question is whether the complexity that we see around us, and the time-scale that we have for change, shows that less change must have taken place, and that therefore there has been initiated change, collapsing and shortening what would otherwise be long chains of spontaneous changes.

**Choosing Changes**

The kind of change to choose (spontaneous or initiated) in an explanation enters our discussion at this point. There is the argument that *all* change is attributable to God, but the question for us here is whether some changes are best explained via slow natural adaptation to environmental conditions and other changes are best explained by initiated change.

Debates between evolutionists and creationists provide examples that illustrate this choice being made in practice. For example, a species' adaptation to an environment is a stock example of evolutionists. The *remoteness* of the Hawaiian Islands is a reasonable explanation for the diversity of a few kinds of organisms (fruitflies, snails and birds) and the absence of native mammals. The geography of the distribution of animals is conducive to evolutionary explanations of adaptation and survival. Indeed, the quantity of change required is perhaps not great in such cases—for instance, in the adaptation of bird beaks. However, contrawise, creationists baulk at the idea of the evolution of *new* species. Postulating initiated change here shortens any hypothetical natural evolution and for a creationist is more credible.

This is an important point of difference. Creationists often affirm that adaptive change of the sort evolutionists point to is a kind of change that is bound by the limits set by the species. We might be able to divide the population of fruitflies into two or more groups incapable of inter-breeding but capable of in-breeding, but this is a variation within the species and reversible. Whilst *in theory* small cumulative change might account for new species, the examples of change that we are given by evolutionists are not illustrations of this happening.

Accordingly, it is not certain that the theory of evolution stacks up. For example, the laboratory evidence for mutations of the *E.Coli* bacterium have been gathered since the 1990s and tens of thousands of

[12] We use this older terminology here in order to recognize that the philosopher and scientist are sharing the same project of understanding.

generation studied. The original organism has degraded through natural selection with 'broken' genes and with genes removed; a new bacterium has not evolved.

Or again, Artificial selection is practised by animal and plant breeders. They employ specialist knowledge. It is a skill that executes intelligent design, although the design is often just about aesthetics rather than any 'survival of the fittest'. The practice hasn't produced new species and the skill is more about modulating the varieties of which a genome is capable. It seems then that Darwinian Theory is known to be valid only for variations within a biological species. The analogy here with our practice of artificial selection is that the sorts of changes to a genome that God can initiate are not restricted.

**Conclusion**

Our discussion of the mechanism of natural selection leads to this conclusion: a mechanism is not an action; it is not divine action; rather, it is a principle or a law about how things are working. Insisting that there has only been spontaneous change is a philosophical choice and excluding co-ordination of the 'selective' environment by God as an explanation is also such a choice; they are not scientific choices. They are part of a metaphysical naturalism. Scripture teaches the opposite—that God has been creatively involved with the earth since its very beginning in actions such a 'forming', 'making', 'creating', and 'saying'—i.e. initiating changes. The harmonisation of the 'Bible and Science' that is theistic evolution (sometimes called evolutionary creationism) where spontaneous change and natural selection is the only explanatory framework is therefore misconceived.