

Darwinian Evolution

Darwin the man

Charles Darwin (1809-1882) was raised as a Protestant and had started down the path of becoming an Anglican clergyman before deciding to pursue natural science. For decades before his *On the Origin of Species* appeared, naturalists had discussed with increasing approval the idea that current species evolved from previous ones. But they were not able to give any naturalistic explanation of the *mechanism* by which this happens. That is precisely what Darwin did in his book, which hypothesizes that new species arise by nature 'selecting' animals that have undergone beneficial random mutations.

The context of Darwin's work

Darwin's era was one of great and, in retrospect, exaggerated optimism in science. Many new breakthroughs had been made in geology and astronomy showing that bodies and formations observed on Earth and in space could be explained by natural processes working over long periods of time. Many people had previously believed that both the bodies in space and on Earth were young and that there was no natural explanation for their formation.

When science was able to establish, with conclusive arguments, that processes of water erosion, chemical combination, fossilization of animals, and movements of subterranean matter can reasonably account for the formation of the physical features of Earth; and when it was able to establish, with equally conclusive arguments, that gravity, heat, nuclear fission, and nuclear fusion can reasonably account for the formation of galaxies, stars, and planets—then many believed that there was also likely to be a naturalistic explanation for the origin of the lifeforms of the biological world. The question was just to find that explanation.

This was why Darwin's book was hailed with so much enthusiasm in its day and has had so much influence in the past 150 years. It provided plausible naturalistic explanations in biology that were seen to be equivalent to the naturalistic explanations that were doing service in the fields of geology and astronomy.

The difference is this: science had successfully provided explanations for changes that take place in inorganic matter—rocks and molecules and such. But Darwin was dealing with biology and so with living things. The only way that a naturalistic explanation for the development of living things would be available in the same way that it was available for the development of non-living things is if the non-living and the living are equivalent in their complexity. In other words, the development of a lizard from a fish would somehow have to be as simple as the development of a star from a body of condensed gas.

It turns out, however, that living things are vastly more complex than non-living things, and thus nature has to do far, far more to make new animals than it does to make new nuclear furnaces.

Darwin's loss of faith

It was over the course of his development of his scientific ideas that Darwin lost his Anglican faith and became an atheist or, at least, an agnostic. This loss of faith started with a false view of the Bible. Darwin believed that Genesis 1,

when frequently speaking of God creating plants and animals ‘according to their kinds’ (1:12, 21, 24–25), teaches that God created each species directly. This teaching appeared to conflict with the scientific conclusions he was formulating from his study of animals in the Galapagos Islands. He says that he became convinced of the “reality of evolution” in the late 1830s and early 1840s. This led him straight into a conflict between faith and reason: “The Bible or the transformation of species: such was [] the basic option for Darwin from which he must proceed”.¹

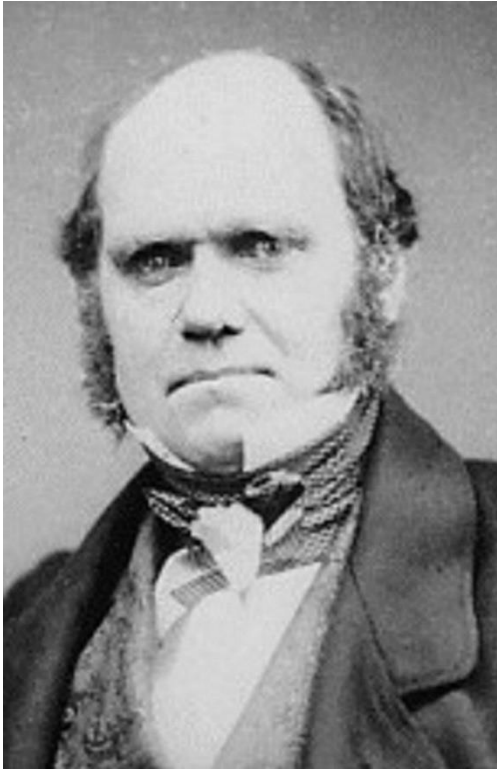


Figure 1: Charles Darwin

will be given below.

According to Gilson, Darwin hesitated 20 years before publishing his *On the Origin of Species* because he anticipated that his theory would destroy the faith of others, as it had destroyed his own. Eventually, he not only overcame his hesitations, but he even prided himself as being the one who removed the notion of creation from biology, in the sense of the direct creation of each individual species.²

The Catholic Church, on the other hand, does not see the long ages of geology and astronomy, or any putative truth of evolution as destroying the truth of the Bible. God could have, for instance, used random mutation and natural selection as a means to cause the appearance of new species of lifeforms. If this were the case, that would not mean that the Bible was false; it would only mean that we would interpret the Bible in line with those findings. We would say that, when Genesis says that God created animals according to their kinds, it means that He created some lifeforms directly, and the others indirectly through the evolutionary mechanism.

This is the reason why Catholics should not argue against evolution using theological arguments. Rather, they should use philosophical and scientific arguments. These arguments are more than sufficient to show that the scope of evolution is extremely narrow indeed. Some of them

Darwin’s Theory

Before Darwin’s theory can be criticized, it must firstly be understood. We will begin with the work of disambiguation: clarifying what is meant by the word “evolution” in its scientific sense.

Meanings of evolution

1. **change over time:** this is an extremely generic definition of evolution and is not the subject of this paper
2. **a genealogy, i.e. common descent:** the idea that all living organisms derive from a common ancestor
3. **the process of change:** the way by which less-evolved organisms developed into more evolved organisms, i.e. random mutation and natural selection

¹ E. Gilson, *From Aristotle to Darwin and Back Again* (San Francisco: Ignatius Press, 2009), p. 71.

² *The Realist Guide to Religion and Science*, p. 261.

By “evolution”, Darwin was referring to the second and the third meanings. It is important to distinguish between these two notions, as evolutionists often lump them into one. In other words, they often pretend that evidence for common descent is the same as evidence for random mutation and natural selection.³ But this is certainly not the case.

The most important thing to be understood about Darwin’s theory is the process, that is, the meaning of the phrase “random mutation and natural selection”.

What does it mean? Darwin observed that human breeders can produce a vast variety of species of animals through their careful breeding. They do this by isolating a population of the animal, a variety of dog for instance, and selecting for breeding only those dogs with certain characteristics, like large, floppy ears. Over time, they are able to develop a race of a certain new type of dog. This process is called *artificial selection*.

Darwin thought that nature might do something similar, i.e. that there might be embedded in natural law a certain automatic selection, by which nature would ‘select’ better animals and set lesser animals aside. This process, if it existed, would be called *natural selection*.

Darwin got his ideas about *how* nature might select from an Anglican minister, T. R. Malthus. Here is my explanation:⁴

Malthus held that human populations grow continually until they hit a certain threshold which matches the available supply of food. At that point, a competition ensues among humans, with some humans acquiring food and surviving, and others failing to get food and perishing.

Darwin took Malthus’s idea for human populations and applied it to all of nature. There are only a limited number of food resources available to plants and animals on this planet, and food resources cannot be shared. As such, there is constant competition among life forms to sustain and propagate life. In such a competition, the stronger and hardier win out and survive. Those who remain have been ‘selected’ by nature, in that nature, after randomly arranging life conditions, has then proceeded to eliminate life forms unable to survive in those conditions, while retaining those able to survive.

Thus, nature ‘selects’ just by providing conditions under which some animals survive, while others do not survive. Darwin hypothesized that a) those who survive are better; b) over time, animals gradually and progressively evolve because the better ones are surviving.

N.B. – ‘selection’ in natural selection is a pure metaphor, in that there is no selection in the essential meaning of the term, which is wilful choice. Rather, there is only selection in that the *effects* of natural selection resemble those that would take place if an intelligent mind were making choices.

³ For instance, Richard Dawkins, in his *The Greatest Show on Earth* (Free Press, 2009), pp. 99-100, refers to evidence for common descent as “powerful evidence for evolution”.

⁴ *The Realist Guide to Religion and Science*, p. 438.

Neo-Darwinism

Darwin did not understand genetics. He had no access to the pioneering work in genetics done by the Austrian Catholic monk Gregor Mendel (1822-1884). As such, he could not really say where diversity in nature comes from. That is, he could not assign any particular cause to the random mutation component of his hypothetical evolutionary process.⁵

When genetics advanced, and especially when DNA became understood, evolutionary biologists came up with what is called the “Modern Evolutionary Synthesis” or simply “Neo-Darwinism”.⁶ It modifies Darwin’s theory to specify that the random mutations of the theory take place through errors in DNA, especially errors made in the transcription and copying of DNA.

Philosophical Problems with Darwin’s Theory

Q: Is Darwin’s theory compatible with realist philosophy?

A: A distinction must be made in the philosophies that can be imposed on Darwinian theory:

- **atheistic Darwinism:** this is when a Darwinist tries to turn evolution into a ‘theory-of-everything’, a total causal explanation for the biological world; it is incompatible with realist philosophy
- **theistic Darwinism:** this is when God is used to causally account for some aspects of the biological world; it can be made compatible with realist philosophy, but only by narrowing the scope of evolution

Q: What are the philosophical problems facing atheistic Darwinism?

A: I treat this question in *The Realist Guide*, pp. 440-456. Effectively, an atheistic evolutionism falls into contradiction in the areas of formal and final causality:

- **formal causality:** if there is no God to make species, which are immaterial types, then species do not exist. What this means is that the atheist materialist must see reality as consisting only of changing matter without there being any agent that is able to provide any fixation or determination to things. There is no God to create a fixed point which can then vary and transition to something else. There are no fixed points; rather, there is only variation.
What are the consequences of this view of reality? Firstly, that would mean that there is no such thing as species. There is no fixation in nature, such that things are what they are and are not something else. If we call this thing a ‘dog’, the word ‘dog’ can only be a label that we use to indicate certain accidental characteristics of that thing; it says nothing about the essence of the thing which, according to the atheist, does not exist.
Secondly, if there is no such thing as species, then everything is the same thing. “If different species do not really exist outside the mind, then the various biological lifeforms are really essentially the same thing. A dog is a bird is a man is a geranium is a cabbage.”

⁵ See G. Verschuuren, *The Myth of an Anti-Science Church* (Angelico Press, 2018), p.51, 147-148. This book is too favourable to Darwinian evolution and does not treat the scientific evidence against it seriously.

⁶ Neo-Darwinism is defined as “the theory that all life shares common ancestry, and evolved through descent with modification, driven by unguided natural selection *acting upon random genetic mutations in DNA*” (Kemper, *Discovering Intelligent Design*, p. 28).

Thirdly, that would mean that evolutionary theory is seeking to explain the origin of species, while at the same time it does not believe that species exist. This makes the theory intrinsically incoherent.

- **final causality:** if there is no God or otherwise intelligent agent to direct nature towards certain goals, then nature is completely undirected and chaotic, and an atheistic evolutionary theory should reflect that vision of reality. But evolutionary theory (really, any theory at all) cannot do without there being directedness in reality. There is one purpose at the very heart of Darwin's theory that is absolutely essential for its survival and that purpose is the *struggle for survival*. Plants and animals must be directed to the goal of surviving for the mechanism of evolution to work, that is, for fitter lifeforms to be 'selected' by nature. Here is David Stove's explanation of the finality embedded in evolutionary theory, in his book *Darwinian Fairytales*:⁷

The famous Darwinian 'struggle for life,' on which the whole theory turns, is a struggle *for* something, is it not?: namely, for survival and for leaving descendants. But in that case it is a *purposive* activity on the part of the individuals which struggle. And in any case, Darwin is always saying things like the following: that 'each organic being is *striving to* increase at a geometrical ratio'; or that 'every single organic being around us may be said to be *striving to the utmost to* increase in numbers.' How could he have ascribed purpose to all organisms more plainly than this?

In fact it is precisely the striving of organisms to live, reproduce, and increase which, according to Darwin, *drives* the whole gigantic process of evolution. If organisms were indifferent towards their own survival and reproduction, or if they positively leaned to the Buddhist side of those issues, there would be no struggle for life, hence no natural selection, and hence no evolution, according to Darwinian theory. So very far is that theory, then, from according no causal role in evolution to purpose.

For this same reason, we should not let ourselves be imposed upon by another group of commonplaces: the ones about Darwinism having expelled 'final causes' from biology. If 'final causes' means purposes, or purposive activities, then Darwinism not only does not 'expel' them: it builds them into the very foundation of its explanation of evolution.

In short, a theory of evolution that tries to explain the whole of the biological world without God being involved in any way falls into contradiction. It has to both affirm and deny the existence of species, and affirm and deny the existence of purposes.

Q: What about theistic evolution? Haven't many Thomists embraced it?

A: Yes, many Thomists have embraced some version of theistic evolution. 20th century Thomists have a history of being quite favourable to the theory. This is particularly true of the Laval school of Thomism, which is characterized by a focus on the history of scholastic philosophy and on the compatibility between Thomism and modern science. Members of that school include Charles de Koninck and, more recently, Fr Benedict Ashley. But evolution was also embraced by Jacques Maritain, Etienne Gilson, and Fr. Sertillanges, and is today embraced by the famous Thomist Edward Feser. At the same time, others were more sceptical about evolution's inherent compatibility with realism.

⁷ D. Stove, *Darwinian Fairytales* (New York: Encounter Books, 1995), pp. 285-286. Stove was an Australian philosopher who wittingly and devastatingly criticized many of the sacred cows of the modern world. Sadly, he was an atheist and took his own life in 1991.

They include Fr. Garrigou-Lagrange, Fr. Austin Woodbury, Mortimer Adler, Cardinal Ruffini and, more recently, Fr. Michael Chaberek.

Q: How do theistic evolutionists try to make Darwinism compatible with realism?

A: They do so by having God take charge of formal and final causes, and having evolution work within what God has done. In other words, God instantiates a certain number of natural species—substances that are of ontologically different orders—and then evolution works within those species to produce variations. Here is how Edward Feser speaks about this position:⁸

There are two basic positions the Aristotelian might take. The first would be to hold that even though transformations between philosophical *subspecies* are naturally possible, transformations between philosophical *species* are not, and would require special divine action. On this view, purely natural transformations within the inanimate realm can give rise to a wide variety of types of inanimate substance. Diverse lines of causality within the inanimate realm might even naturally converge in such a way as to provide the material cause of a living substance. But for these inanimate precursors to give rise to a truly living substance would require special divine action to introduce the needed substantial form. Once this most simple vegetative form of life exists, then through purely natural means, a wide variety of vegetative forms might evolve. Diverse lines of causality within the vegetative realm might even naturally converge in such a way as to provide the material cause of a sensory or animal substance. But once again, special divine action would be required to introduce into the process a distinctively animal sort of substantial form. Once the simplest forms of animal life exist, purely natural evolutionary processes could give rise to a wide variety of animal forms, and diverse lines of causality could naturally converge to provide the material cause of a rational or human form of life. But once again, special divine action would be required to introduce a distinctively human substantial form.

To take an example of this position, Charles de Koninck held that there are four types of natural species and so basically four different types of substances in the material world: men, animals, plants, and the inorganic. This reduction of all species to four provides evolution a wide scope for variation *within* those species. Thus, God would be responsible for the creation of, say, a prokaryote⁹ bacterium, and then evolution would step in to cause the rest of the animals to come into being, from the fishes to the reptiles to the mammals.

Q: Are there any other problems with this idea of theistic evolution?

⁸ *Aristotle's Revenge* (Editiones Scholasticae: Germany, 2019), p. 429.

⁹ A prokaryote is “a microscopic single-celled organism which has neither a distinct nucleus with a membrane nor other specialized organelles” (Oxford Dictionary of English).

A: There are major scientific problems with theistic evolution, but we will get to those later. Meanwhile, we will leave to Fr. Chaberek to express how there is still a good deal of tension between evolution and Thomism in this system, since the scope of evolution is narrowed:¹⁰

As much as the reduction of species to just four (alternatively one, three or five) may seem attractive for those who strive to save biological macroevolution, yet it is far from Aristotelian-Thomistic metaphysics. Moreover, it is also far from what the evolutionary theories of origins actually postulate. In De Koninck’s scenario, for example, God would need to produce supernaturally inanimate beings, then the first plants, first animals, and first humans. The *physical continuity* of the whole evolutionary story would be interrupted at least three times. And this is already unacceptable to epistemological naturalism which underlies all evolutionary theories of origins such as neo-Darwinism. *Species reductionism*, therefore, does not resolve the conflict between classical metaphysics and biological macroevolution. It only makes it less apparent.

Q: Could you provide a summary of the philosophical positions that can be taken on the question of evolution?

A: Yes, we should do that. As with every topic, there are two extreme positions and many middle positions between those extremes. The two extremes are that God does everything by direct creation and nature does nothing, a position known as *occasionalism*; and that nature does everything and God does no creating, the position known as *atheism*. In between those extremes are all of the positions holding that God does part of the work of causing biological diversity by direct creation and nature does the other part of the work by evolution.

Position on the cause of biological diversity	Cause of life from non-life	Cause of first plant and first animal	Cause of domains, kingdoms, phyla, classes, and orders	Cause of families, genera and species
Atheist	Nature	Nature	Nature	Nature
BioLogos¹¹	God/Nature	Nature	Nature	Nature
Typical Thomist	God	God	Nature	Nature
Intelligent Design	God	God	God	Nature
Occasionalist	God	God	God	God

Note: The position of the Intelligent Design movement is more nuanced than what is represented in this chart, which purposely simplifies the positions for the sake of clarity. The proponents of ID hold that some intelligent being must be responsible for the production of lifeforms, but they are unable to say who that being was, because of the limits of their scientific method of investigation.

¹⁰ M. Chaberek, “Classical Metaphysics and Theistic Evolution: Why Are They Incompatible?”, *Studia Gilsoniana* 8, n.1 (January-March 2019), p. 74.

¹¹ BioLogos is an organization which “invites the church and the world to see the harmony between science and biblical faith as we present an evolutionary understanding of God’s creation.” In other words, its members seek to promote theistic evolution. They are unsure as yet whether life evolved from non-life, but they affirm as certain that evolution is responsible for the whole of the diversity of the biological world.

Scientific Evaluation of Darwinism

Overall position: there is a certain degree of solid evidence for common descent; there is little to no evidence that this was caused by random mutation and natural selection

Evidence for common descent

- morphology:** all mammals have the same basic body type, e.g. they have seven cervical vertebrae.
Darwin: “The framework of bones being the same in the hand of a man, wing of a bat, fin of the porpoise, and leg of the horse—the same number of vertebrae forming the neck of the giraffe and of the elephant—and innumerable other such facts, at once explain themselves on the theory of descent with slow and slight successive modifications.”
- fossil record:** it shows a progression from less complex to more complex. Initially, there are only plants, then simple animals appear, followed by more complex animals, until man appears last in the animal record. The first animals to appear are invertebrates, then vertebrate fish, then reptiles, then birds, then non-placental mammals, then placental mammals, then man. See the diagram to the right.
- DNA analysis:** all living things—plants and animals—have DNA encoded in them, and the coding is more similar according to the closeness of the plants and animals in the hierarchy of complexity.

Example of #3: When proteins were sequenced for the first time, in the last 1950s and early 1960s, the following results were observed:¹²

Proteins that did the same job were similar yet different between species, but became more different as the biological distance between the species increased. For example, a small protein called cytochrome *c*, which helps produce energy in the cell, was determined to be identical in humans and chimpanzees in all 104 of its amino-acid positions. Between humans and dogs there were 11 differences. Between us and tuna, 21. Between people and moths, almost a third of the total positions differed. Between humans and yeast, almost half.

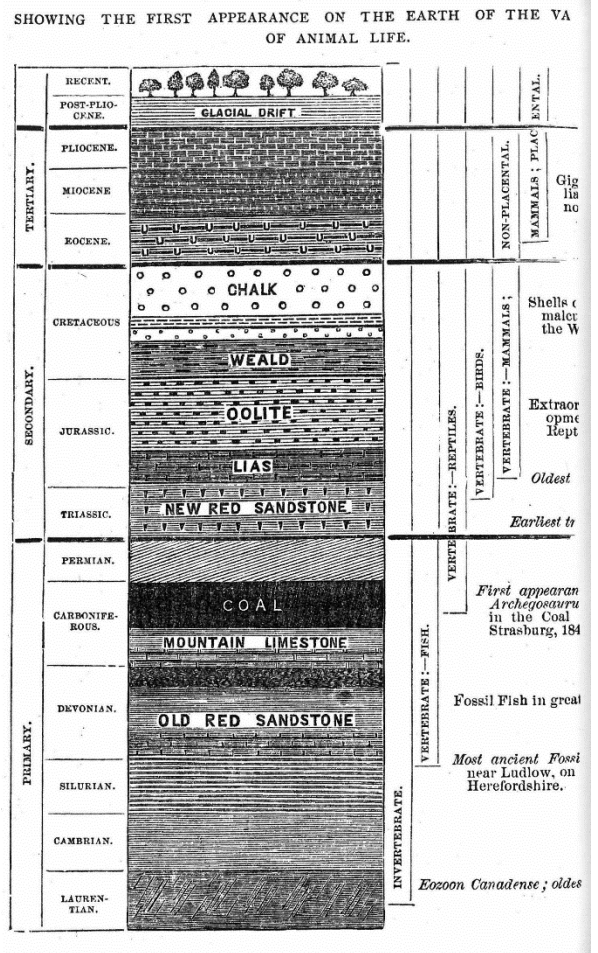


Figure 2: Diagram from page 226 of Fr Gerard Molloy's 1869 book *Geology and Revelation*

¹² M. Behe, *Darwin Devolves* (New York: HarperOne, 2019), p. 76.

Species	Sequence				Differences
human	vlspadktnv	kaawgkvgah	ageygaeale	rmflsfpttk	--
chimp	vlspadktnv	kaawgkvgah	ageygaeale	rmflsfpttk	0
orangutan	vlspadktnv	kTawgkvgah	agDygaeale	rmflsfpttk	2
cow	vlsAadkGnv	kaawgkvgGh	aAeygaeale	rmflsfpttk	4
kangaroo	vlsAadkGHv	kaIwgkvgGh	ageyAaeGle	rTfHsfpttk	9
frog	LlsADdkKHI	kaIMPATAAh	GDKFgGealY	rmfIVNpKtk	22

Figure 3.1. Amino-acid sequence of the first forty positions of the alpha chain of hemoglobin from various species. Each letter is the abbreviation for a different kind of amino acid (v for valine, l for leucine, etc.). Differences from the human sequence are capitalized. A space is added after each ten letters just to facilitate viewing.

Figure 3: An example of sequencing evidence for common descent

Q: Does this evidence for common descent mean that Darwinian evolution is true?

A: Not necessarily. If, in fact, all living things are related, and higher lifeforms come from lower lifeforms, that does not mean that the higher come from the lower

by a process of random mutation and natural selection. There are many other processes that could cause new species of life to come from already existing species. God, for instance, could certainly make new animals from old animals. And, in theory, other intelligent agents, such as angels, could design new animals.¹³ Regardless, today's scientific evidence indicates clearly that random mutation and natural selection are utterly insufficient to produce new forms of life. Thus, if new forms of life historically descended from already existing ones, then it had to have taken place through a process different from the one described by Darwin and his followers.

Note that if some intelligent agent made new animals from old animals, we could not say that the new descended from the old in the same way that the word "descent" is used in biology. In the biological meaning of the term, one thing descends from another when it has been *physically generated* by its parents and ancestors. A common descent that would come about by an intelligent agency would not be by physical generation, but by a certain re-engineering of already existing animals. The new animals would be said to descend from the others only in the sense that the genetic material of the old animals was modified to make new animals. It would be like saying that a certain advanced form of technology, such as a smartphone, is a descendant of a more primitive form of technology, such as the first desktop computers. Therefore, in view of the very strong evidence against macro-evolution, science does not support the notion of "common descent" in the full or intuitive sense of the term.

Evidence against random mutation and natural selection

In theory, random mutation and natural selection could account for the totality of the differences spanning between microbes and man. In practice, it seems that the Darwinian mechanism can only account for very small, accidental changes in living things. Darwin recognized that many assumptions had to be made about nature for his mechanism to have the explanatory power necessary to account for the great diversity that we see in the things around us. At the time that he made those assumptions, they had not been tested by science, and so his theory was at least *plausible*.¹⁴

¹³ Some authors speculate that bad angels might be responsible for the nefarious organisms that seem specifically designed to attack and destroy human beings, such as the malaria parasite or viruses. But this is highly speculative, pertains more to theology than science, and is well beyond the information that God has chosen to reveal to us.

¹⁴ Here is Michael Behe's comment on this topic in *Darwin Devolves*, pp. 255-256: "Darwin did not show that apparently purposeful systems could be built by natural selection acting on random variation. Rather, he just proposed that they might. His theory had yet to be tested at the profound depths of life. In fact, no one then even realized life had such depths. Darwin built a case with the best science available in the nineteenth century. The case was pretty strong for a few of his theory's multiple aspects, including the descent of modern organisms from earlier ones. It was extremely weak for his proposed mechanism of evolution. A major reason for its weakness is that the science of Darwin's day had no understanding of the molecular foundation of life."

Today, however, we have more than enough evidence to conclude that some of his major assumptions were completely false. Let us consider the assumptions and contrast them with the evidence of science.

Assumption 1: Gradualness

Assumption: The biological world is a continuum wherein only little differences separate individual lifeforms one from another. It is only when populations are isolated that they are able to accumulate differences that will separate them from the rest of the biological world and so become new species, genera, and so on.

Testing: this assumption can be tested by inspecting nature. If the assumption is true, we would expect to find a great fluidity in biological lifeforms, such that it is easy to change them in small ways that bring in new functions and so accumulate those small changes that they eventually develop into vastly different lifeforms. We would also expect them to be composed of interchangeable parts, such that if one part is substituted for another, the plant or animal still functions. We would further expect to find great continuity in the fossil record, with there being smooth and gradual changes throughout the history of life.

Evidence 1: irreducible complexity¹⁵

Instead of finding a great plasticity among things in the biological world, we rather find a great rigidity, such that lifeforms are quite sensitive to any changes. The notion of irreducible complexity highlights this fact. It exists whenever some organ or function of a plant or animal has multiple interacting parts and the removal of any part causes the system to effectively cease functioning.

The existence of irreducibly complex parts is contrary to Darwin's assumptions about living things, because irreducibly complex organs cannot be constructed gradually. They must have all of their parts put together at once for them to be functional. If one part is missing, the organ or function does not work. Thus, the construction of irreducibly complex organs must be instantaneous and cannot be gradually worked out, step by step, over millions of years, by a blind process of random mutation and natural selection.

Almost everything that we find in the biological world is irreducibly complex, both at the macro level and the micro level. Lifeforms are not gooey, amorphous stuff that can be shaped and reshaped willy-nilly. Rather, they are very delicate and intricate constructions wherein all of the parts have to be in place for them to function.

In other words, since Darwin, we have closely investigated living things to a level of detail unimaginable in Darwin's time. If Darwin's assumption about living things was correct, then we would have found that natural laws are very favourable to the production of functional parts in plants and animals. Nature would be so designed that new functions would easily be produced by plants and animals doing their thing and interacting with their environment. The only way that this could be true is if living things were quite simple and the production of a function would take place by basic chemical combinations or raw forces. What we have rather found is that lifeforms are extremely delicate and unimaginably complex. And nature is just not designed to automatically produce complex new forms of life, in the way that unintelligent bees, for instance, are designed to automatically form colonies, construct complex hives, produce wax and honey, and so on.

An example will be helpful to illustrate what I am saying. Say you go to a casino and play roulette. When you play, you know that every spin of the roulette wheel will turn up a number. Every spin, we could say, will be functional in that it will yield a number and not yield a null result. Now, nature would be like this for evolution if every variation of a

¹⁵ This notion was famously popularized in Catholic biochemist Michael Behe's 1996 best-selling book *Darwin's Black Box*.

lifeform would yield some function. Isolate a group of mockingbirds on an island, have them undergo “selection pressures” which cause them to change, and new functions start to appear.

What we have found is that the biological world is not like this. On the contrary, it is like a roulette wheel wherein the vast majority of the slots have no number at all. Thus, the most common outcome when you spin the wheel is that you get a null result. This is precisely what we find in nature when we try to change the genomes of lifeforms. The vast majority of the time, there is either no change of function or death results to the lifeform. Only on vanishingly rare occasions is there any improvement to the organism.

But, you may ask, aren’t those rare occasions enough to explain the advent of new types of animals? No, they are not, for even when they provide a survival advantage, they do not produce a new function. Rather, the survival advantage comes at the expense of a degradation of the genome, as we will see below.¹⁶

We would expect this degradation of the genome to be the only possible outcome if animals were intricately designed to be precisely what they are. If such is the case, then any noticeable change in their DNA coding will start to break down what they are. In other words, the modification of perfectly integrated wholes can only go in one direction, in the direction of devolution. The fact that science is showing that mutations of the genome only degrade it provides solid evidence that lifeforms are perfectly designed to be what they are.

Example of irreducible complexity: the bacterial flagellum. The flagellum is an organ that bacteria use to swim. Its design is similar to that of outboard motors that are placed at the back of small boats. All of the parts of the flagellum—a paddle, a rotor, and a motor—must be in place for it to function. If they do not function, the bacteria die.

Evidence 2: the fossil record

While the fossil record shows great evidence of a progression from less complex to more complex, in a single direction, it also shows that the progression has happened abruptly, not gradually. There are huge gaps of complexity between one layer and another in the fossil record.

Example: the Cambrian explosion. The most famous example of this is the so-called Cambrian explosion.¹⁷ After hundreds of millions of years seeing only very basic sea sponges in the fossil record, suddenly a vast array of complex

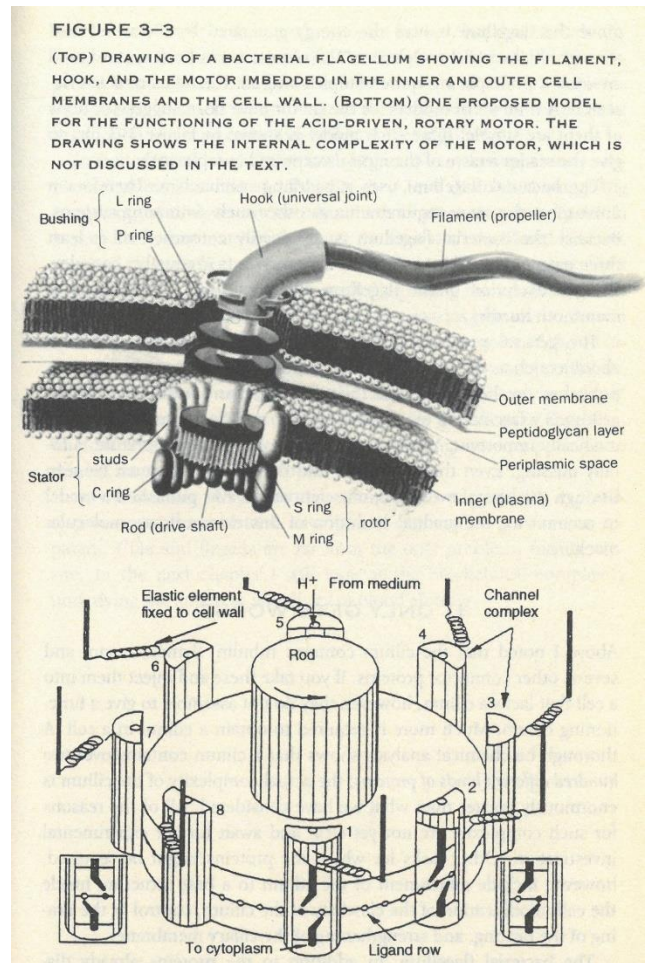


Figure 4: Illustration of the bacterial flagellum found on p. 71 of Darwin’s Black Box

¹⁶ Once we understand that lifeforms contain intricately coded specified information, in DNA, we realize that changing one animal into another of a different species must involve a re-coding of the DNA (at least, that is what it would take on the material level). But only intelligent agents are capable of re-writing code.

¹⁷ The best book on this topic is S. Meyer, *Darwin’s Doubt* (New York: HarperOne, 2013).

animals with completely new body plans appear at the beginning of what is classified as the Cambrian period. The appearance is so sudden that it looks like a pulse to the geologists, an instantaneous interjection of life.

Moreover, Darwin predicted that the fossil record would manifest a bottom-up tree of life, with more specific taxonomical groupings appearing first and slowly increasing—groupings like species, genera, and families—and then over time, a differentiation of the more universal categories, such as orders, phyla and kingdoms. But the fossil record shows the opposite of this, especially in the Cambrian explosion. All of a sudden, vastly different body plans—vastly different phyla, a very generic taxonomical category—appear without any preparatory species, genera, families, classes, and so on of those phyla.

This topic is treated in *The Realist Guide to Religion and Science* on pp. 457-462. Here is how Augros and Stanciu explain it:

This “pattern of shift from few species in many groups to many species in fewer groups” flatly contradicts Darwinian gradualism; for if evolution proceeded by species accumulating small variations, we should see over long periods new orders, classes, and phyla emerging with increasing frequency. But just the opposite occurs in the fossils. Darwin’s model is backward.¹⁸

The fact is that the fossil record starts with vastly different ‘themes’ of animals and then diversifies with variations on each of those themes, and the variations progressively have fewer differences between them. What this means is that the entire diversity of biological form is present at the beginning and simply works itself out over time, rather than there being no diversity present at the beginning and it being produced over time by natural selection.

Objection: We don’t have all of the fossils yet.

Answer: we have great reason to believe that we have all of the representative fossils that we will ever have. Besides, the general orientation of the fossil record, around the world, is opposite to what Darwin predicted.

Evidence 3: fixation in species

Plants and animals do not allow for unlimited change. They have fixed boundaries beyond which they cannot be pushed. Here is some of the evidence cited by Augros and Stanciu:¹⁹

Between 1800 and 1878, crossbreeding increased the sugar content of sugar beets from 6 percent to 17 percent. But fifty years of subsequent experiments produced no further increases. All experienced breeders recognize the constraints. Luther Burbank: “I know from my experience that I can develop a plum half an inch long or one two and a half inches long, with every possible length in between, but I am willing to admit that it is hopeless to try to get a plum the size of a small pea, or one as big as a grapefruit.”

Saturation Mutagenesis: this is a method of experimentation by which one seeks to explore the complete limits of a species for genetic modification. These experiments indicate that animals simply cannot sustain any major changes, a

¹⁸ *The New Biology*, p. 169.

¹⁹ *The New Biology: Discovering the Wisdom of Nature* (Boston and London: New Science Library, 1987), p. 159.

fact that leads us to be sceptical about the very possibility of macroevolution with biological species as we know them. Here I quote from *The Realist Guide*, pp. 465-466:

Two German geneticists, starting in 1979, executed ‘saturation mutagenesis’ experiments on fruit flies. What this means is that they isolated ‘the small subset of genes that specifically regulate embryonic development’²⁰ and mutated one or more of those genes in different fruit fly embryos until eventually they had mutated *all of them*. Most of the mutants ‘perished as deformed larvae long before achieving reproductive age’. Others survived and had major changes, but all such changes were deleterious—some fruit flies had no eyes, others had legs growing out of their heads, and still others had wings deformed in such a way that they could not fly. None of them turned into a new species with greater functionality.

But, as Meyer points out, we should not expect new and better animals to develop from introducing random mutations into the embryonic development. The reason is that the egg to embryo process is delicate and complex, with every part needing to be in its proper place, at the right time, performing its assigned function, for the result to be correct. If you introduce changes at one stage and do not compensate for that change at the other stages, then you will ruin the entire process. The only way to make a beneficial change would be to accompany that change with corresponding changes at *every* stage. Evolution cannot do this, though, since it works by gradual changes, which is the same as saying that it works by *single* changes.

This situation leads to the ‘great Darwinian paradox’: animals *do not* tolerate mutations at the *beginning* of their development, but that is the only time that they can be changed substantially; they *do* tolerate mutations *after* they have developed, but such mutations can only induce minor changes. The empirical evidence, then, seems to clearly indicate that large-scale, macroevolution is impossible.

Actual examples of evolution: for all of the real-life instances of Darwinian evolution that have been observed, the changes in the organisms have been quite small. Even Richard Dawkins cannot point to any real examples of macroevolution, as I point out:²¹

Richard Dawkins thinks that evolution is able to go all the way to the top, producing new phyla, new kingdoms, and new domains. When I was reading through the 450 pages of his *The Greatest Show on Earth*, I kept waiting for the showstopping argument to appear, that ‘sheer weight of evidence’ which ‘totally, and utterly, sledgehammeringly,

²⁰ This and the succeeding quotations within the quotation are taken from Stephen Meyer, *Darwin’s Doubt* (New York: HarperOne, 2013), pp. 256-262.

²¹ *The Realist Guide*, p. 467.

overwhelmingly strongly supports the conclusion that evolution is true'. I knew that if such evidence existed in any way, shape, or form, Dawkins would lay it out on the table.

By and large, however, the table was not set with any empirical evidence for macro-evolution and was only decorated with evidence for micro-evolution: lizards from one island getting larger heads, a greater bite force, and a different diet after being transported to another island; certain bacteria, over tens of thousands of generations in a laboratory, adapting to assimilate glucose and citrate, becoming much larger than bacteria not adapting to do so; guppies in ponds with predators losing spots over time and hence becoming less visible to those predators, while guppies in ponds without predators becoming more colourful/visible over time.⁶⁹ Whenever larger changes came up, Dawkins had to shift to speculations, metaphors, and his rigged computer programs. In the end, he just expects us to 'take his word for it' that macroevolution is a fact, since he cannot prove it to us.

Assumption 2: Competition

Assumption: There is a ruthless competition for resources of food, water, and living space among plants and animals. This competition drives stronger lifeforms to develop survival strategies that make them evolve while weaker lifeforms die out.

Testing: this assumption can be analysed by observing all of the animals and plants in a general area to investigate their use of the resources of space, air, water, food, sunlight, and so on. These field studies had not been done in the time of Darwin, who was simply working on the assumptions that Malthus had made about human populations and was applying those assumptions to populations in nature.

Evidence: nature not in a state of fierce competition. Instead of competition in nature, there is rather cooperation. Nature is not "red in tooth and claw", but rather replete with harmonious co-existence.

If we define competition as "whenever two or more individuals or groups 'strive together' for something in short supply"²², we find that nature employs many strategies to *prevent* competition:

- geographical isolation of species that could eliminate each other;
- the division of lifeforms living in the same habitat into different ecological niches, that is, different diets, different periods of activity, different changes introduced into the environment, and so on: "among the most thoroughly documented principles in the science of ecology is the dictum that two species never occupy the same niche";
- mutual sharing of resources—space, light, water and food—so that as many as possible can survive, rather than the pursuit of mutual elimination;
- periodic migration of birds, fish, mammals, and insects to avoid competition;
- sequential flowering of plants to avoid competition in attracting pollinators;
- even predators are kind to their prey by never eliminating its species and also maintaining with it a dynamic equilibrium;

²² *The New Biology*, pp. 91, 93.

- symbiotic relationships between animals such that two species have a mutual interdependence: this interdependence is even found between the whole of the plant kingdom, which produces oxygen needed by animals, and that of the animal kingdom, which produces carbon dioxide needed by plants.

In short, population is regulated internally by the plants and animals themselves. It is not regulated from the outside by a fierce competition between them. Nor are they at war with their environment.

Assumption 3: Evolution

Assumption: The random mutations that occur in genetic code, that are then preserved by natural selection, are advantageous to their organisms.

Testing: to assess this assumption, it is necessary to investigate concrete cases of evolution, wherein we know that changes have been made in the genetic code of a given species, we can specify those random mutations down to the very amino acids that have been changed, and we can judge the overall impact that those changes have had on the animal's functionality.

Evidence: Darwin assumed that some random mutations could provide a survival advantage for plants and animals and also that the survival advantage would come from enhanced functionality in the plants and animals. Modern scientific studies have shown that the first assumption was correct, but the second one was false. Some random mutations do provide a survival advantage. However, they do this by *breaking* function in the genome, not by enhancing function. In other words, almost all random mutations that provide a survival advantage are the result of a *devolution*, not an *evolution*.

The amazing but in retrospect unsurprising fact established by the diligent work of many investigators in laboratory evolution over decades is that the great majority of even beneficial positively selected mutations damage an organism's genetic information—either degrading or outright destroying functional coded elements.²³

In other words, when random mutation provides a benefit to a plant or animal, it almost always does so by *damaging* its genetic material. Just as throwing cargo overboard can sometimes make for the survival of the crew, so too, in the world of life, the destruction of certain functions has sometimes provided lifeforms with a survival advantage. When it does, natural selection then steps in to conserve the damaged genetic material. The plants or animals with certain debilitated functions are the ones that survive.

Once the devolution takes place, there is no getting the good genes back again. You throw the cargo overboard in order to obtain a temporary advantage, but you have to suffer the long-term consequences: there is no way to retrieve the cargo.

Degrading machinery can be useful for some purposes—perhaps because its function is unneeded at the time, and so the scrapped machine doesn't waste energy; or because in changed circumstances the product the machine made is now detrimental; or some other reason. But natural selection can't build a coherent new system.²⁴

²³ *Darwin Devolves*, p. 183.

²⁴ *Ibid.*, p. 201.

Natural selection preserves the degradation, and it cannot reconstruct the missing function. The reason is that natural selection is blind. As mentioned above, natural ‘selection’ is a mere metaphor; there is no actual selection taking place. If there were, the selector could note that damaged animals might have a temporary survival advantage, but retaining them in the population would not be good in the long run. Since natural selection is blind—since it is simply a term saying that those who survive in nature are the ones more apt to survive—it “will favor the increase in the number of organisms that do better in their environment for any reason, regardless of the basis of the variation”.²⁵

What scientists have learned, then, through a more detailed knowledge of the molecular basis of life, is that the little variation that we are able to observe in nature as being caused by random mutation and natural selection—the appearance of new species and genera—is actually the result of loss of function and so devolution, reduces the possibility of any further change by restricting the variability of the genome, and provides no explanation for any notable feature of the biological world.

Example: the polar bear is able to survive in the Arctic, because it is a brown bear with broken genes.

[The polar bear is] a variety of brown bear that “evolved” to survive in arctic cold (in fact, it can hybridize with Alaskan brown bears). How did it do that? Behe shows that genes for regulating fat and for metabolizing cholesterol became broken or blunted, and this had a side effect of keeping the bears warm in cold climates, changing their coat color, while permitting them to survive on fatty diets of seals. Darwin’s mechanism did not create anything new; it broke things, but in the case of the polar bear, it worked out.²⁶

The Edge of Evolution

Once we realize that all living things run on a coded language, and also that they are chock full of irreducibly complex features, we understand that no gradualistic process can account for their diversification. To get new plants and animals, you are going to have to rewrite DNA code. You are going to use some of the modules and code that is already there, but you are going to have to rewrite the program to serve the goal of the new lifeform, which is one and the same as the formality of the new plant/animal coming into existence. There is no question of changing one line of code every five years for a million years in order to produce a new lifeform. Coded languages just don’t work that way.

When this is understood, the question then becomes: to what degree is nature able to accomplish, on its own, simultaneous changes in lifeforms? Can nature, in fact, produce a sufficient number of simultaneous mutations, such that it rewrites the DNA code of organisms and so produces new ones?

By asking these questions, we are effectively asking what the limits of evolution are. We are trying to find the level of its innovative capacities in nature. We are asking about the level of change that random mutation and natural selection are capable of introducing into the biological world.

Evidence: Peter and Rosemary Grant did exhaustive investigations of the Galapagos finches and, using newly-developed techniques, sequenced the genomes of 120 of them, enabling them to determine which genes cause variation in the finches’ beak size. Similar studies were done on hundreds of species of cichlid fish in African lakes, with differences being traced all the way down to the level of the genome. In those cases, and others cited by Behe in

²⁵ *Ibid.*, p. 203.

²⁶ <https://evolutionnews.org/2019/07/behe-vindicated-again-goldfish-are-broken-carp/>

Darwin Devolves, the changes were quite small, and they were never sufficient to introduce a new biological *family* into the world (in the Linnaean system of taxonomical classification, species is the lowest level, then genus, then family).

More specific evidence: In his book *The Edge of Evolution*, Behe considers real life situations wherein multiple random mutations have to happen at the same time in order to achieve a survival advantage. He shows that malaria parasites needed two mutations at once in order to develop resistance to the anti-malarial drug chloroquine:²⁷

Americans had developed an antimalarial drug called 'chloroquine', having quinine as its active ingredient. The drug did wonders in curing malarial patients for decades, but slowly decreased in its effectiveness until it became useless in the 1980s. The reason its healing ability waned was that malaria was developing resistance to the drug by means of a double random mutation. A change in positions 76 and 220 of one of the 5,300 proteins in malaria, a protein that has 424 amino acids, gives a malaria parasite resistance to chloroquine.

The malaria were 'able' to have the precise double mutation they needed because their population was large enough that the chances for having the double mutation corresponded to the number of mutations happening:

The double mutation which makes malaria resistant to chloroquine is more difficult. Even with a trillion malaria in the body, busy copying their DNA and sometimes making random mistakes, there is only a one in a hundred million chance for a malaria parasite to get the double mutation ($10^{20} / 10^{12} = 100,000,000$ or 10^8). How, then, did malaria happen upon that precise mutation in order to defeat chloroquine? By invading a billion people (10^9). That is how many people have malaria, and a trillion malaria pests being in a billion people means that the actual population of the parasites is a trillion times a billion or 10^{21} . This is sufficient to provide all the chances necessary for a double mutation.

This is a real-life case of a precise, simultaneous, double random mutation being needed for a species to survive. If such a mutation were ever needed for the human race, we could not expect it to happen:

There are just not enough humans around. To get all of the tries necessary for such a mutation, we would have to wait until the number of humans who existed in our entire history reached 10^{20} , and that waiting period is 'many times the age of the universe'.

Thus, says Behe, it is reasonable to conclude that 'no mutation that is of the same complexity as chloroquine resistance in malaria arose by Darwinian evolution in the line leading to humans in the past ten million years'.

As for a quadruple simultaneous specific mutation, the chances of it happening are 1 in 10^{40} and the population of the most numerous organism on earth—bacteria—is not sufficient to provide the chances necessary for such a mutation. These, then, are the facts:

²⁷ *The Realist Guide*, pp. 472-473.

1. Evolution relies on the 'creative ability' of random mutation.
2. The most creative that random mutations can be, at any moment of time, is to produce a specific triple mutation.
3. Life is teeming with functions that would have required much more than a specific triple mutation for those functions to arise by a random mutation.
4. We can conclude, then, that the vast majority of the functions of the organisms of the biological world are beyond the reach of random mutation.

Conclusion

There are three angles from which Darwin's theory of evolution can be approached: theology, philosophy and science.

Catholic theology teaches us that God created all things and that His Providence rules over the universe. However, it does not teach us that God has revealed how the universe has developed over time or the history of biological life on Earth. As such, Catholics must hold that whatever has happened and is happening has been designed by God. They must also believe that God directly creates the immaterial souls of each and every human being. But they are not required to oppose evolutionary theory on grounds of faith, for the reason that God *could* have made evolution part of His plan for the development of life.

Realist philosophy teaches us that evolution is only possible within a natural species. It would break the law of causality for the members of a lower natural species, such as plants, to evolve into a higher natural species, animals. For this reason, even the most ardent Catholic theistic evolutionists, such as Charles De Koninck, hold that God must have directly created the first plants, the first animals, and the first human bodies. For them, it is simply ridiculous to think that all living things belong to the same natural species. Thus, realist philosophy has us narrow the scope of evolution to work within natural species. At the same time, it is not able to say exactly where the boundaries between natural species lie.

Modern science provides us the most specific information for evaluating the explanatory power of the Darwinian mechanism. It shows us that lifeforms are exceedingly complex, that they are delicate, that they are quite fixed in their biological type and that they only allow minor variations. It also shows us that the genomic material of life and the environment that surrounds us are simply not designed to cause vast changes in the biological world just by the automatic running of natural processes.

Furthermore, detailed studies of lifeforms at the biochemical level as well as the macro level in the environment indicate that random mutation and natural selection can only, at the most, account for the appearance of a few new biological species and genera. These studies can be characterized as exhaustive, not in the sense that no more work is to be done, but rather in the sense that they have provided us sufficient data such that we are able to draw definitive conclusions about the scope of Darwinian evolution on our planet. We know the conditions of Earth's environment, we know the fossil record, we know the genomic material of living things, and we know what changes are possible and what are not in that genomic material.

Thus, we can safely conclude, on the basis of science, that the Darwinian mechanism explains very little about the origin and diversity of lifeforms on Earth. It is simply not a cause that is adequate for originating new plants and new animals. Macroevolution, in short, is not part of the history of life on this planet. The adequate and real cause for the "origin of species" on Earth must be found elsewhere.