

Life Without Evolution

*A Comprehensive Deconstruction of Biological Evolution
According to Darwin Presented in 3 Essays*

By Nicolas Spencer Brown

Essay 1

***The Illusion of the Word
'Evolution'***

*But if thought corrupts language,
language can also corrupt thought.*

George Orwell, *Politics and the English Language*, 1946

Contents

A Word Having Great Power	3
Everything Changes	4
Limits to Change	4
Evolution as Fact.	8
Evolution as Theory	9
Evolution as Belief	11
Blending Fact, Theory and Belief	14
Blending Replacement and Transmutation	14
Speciation and the Origin of Species	18
Microevolution and Macroevolution	21
Merging Science and Philosophy	25
Cosmic Evolution	26
Atheistic Evolution	26
Theistic Evolution	29
Summary and Conclusions	34
Authored and General Sources	35

A Word Having Great Power

Words. . . The particles of human communication; the seeds by which human thought is dispersed. Yet words are chameleon, clothed by the speaker only to be refashioned upon each recipient. The writer's word, chosen to express sense and sincerity, may be morphed by the reader into misguidance and misunderstanding. One word, the same word, can be used to enlighten and teach, or to manipulate and indoctrinate.

Once brought to life, some words gather and inflate in meaning far beyond their original narrow definition. A single word, in one person's mind, will encompass an entire wisdom of world philosophy; while to another, that same word represents all that is badly conceived.

Certain words act as magnets for strong emotional feelings; as flags on which to pin moral statements; or as bedrocks to anchor a sense of self-identity.

Words do indeed have great power, no less than the ideas they symbolise. Powerful words divide intellects, capriciously sparking both passion and prejudice.

The word 'evolution' incorporates all of the above.

I have heard evolution described many times as 'the single biggest idea in science'. The one thing that evolution is definitely not is a single idea. Nor is it an idea confined in people's minds to science.

Within science, an infinite spectrum of observations, phenomena, assumptions and interpretations are both individually and collectively labelled as 'evolution'. A word of such expansive fluidity is at once vulnerable and malleable to subjective intent: it therefore falls upon each student to try to discern whether a particular use of the word 'evolution' is being applied to fact, theory, or belief. Nor should 'the process of evolution' be considered a single process, since many different mechanisms have been proposed (and contradicted) to account for organic change. To many, evolution is a strictly scientific theory supported by a 'mountain of evidence'; but to others it is scientific only in language, and remiss in scientific truth.

'Evolutionary' is an adjective bestowed upon the titles of prestigious research establishments, highly regarded scientific journals, and enviable employment positions. The evolutionary biologist and the evolutionary psychologist have long replaced the religious cleric in revealing to the populace insights and discoveries into the meaning and morality of life, interpreted according to the 'science' of evolution. This is power indeed.

Outside of science, evolution can stand as the proof that no creator god need exist, or, perversely, as proof of the wondrous workings of God. When evolution forms part of an anti-religious or religious position, motivations for defending (or promoting) the idea of evolution are no longer confined to objective science. There is also an abundance of pseudoscience disguised under the auspices of *evolutionary psychology*, through which anyone can link obscure human or animal behaviours to supposed evolutionary history, without any possibility of testing such claims – bedrooms are usually upstairs because we used to sleep in trees.

The only sense in which evolution could be said to be a single idea, is in the premise that all life on Earth arose through natural causes alone; and this is a philosophical idea, not a scientific one.

The illusion sold by the language of evolution – that of an all-commanding, all-explaining, unified principle of life – is marketed by the highly repetitive, mantric-like use of the brand word 'evolution' itself. The objective of this essay is to deconstruct

the equivocal language and ambiguous meanings that underlie the teaching of evolution, revealing how the convoluted manipulation of fact, theory and belief has generated what has become the most intellectually sophisticated deception of all time.

Everything Changes

In its broadest sense evolution just means change over time; typically change as a continuous, gradual development. Since everything changes, so might it be said that everything evolves. In the biological state everything must change and evolve too; so how can we not believe in biological or organic evolution?

We live in a world that is constantly evolving at every level. Our planet is in a permanent state of flux: continents slide, weather patterns wander, glaciers ebb and flow, and mountains tower then tumble. More immediately, we are exposed to technological evolution; computers and communication systems increase in efficiency and sophistication at a rate fast enough to divide generations. Society is a great witness to evolution; morals, ethics, politics, religion, art, science and fashion are all subject to the influence of the decade. Ultimately we learn to appreciate that there is very little that does not change or evolve; even the theory of organic evolution itself evolves! And of course the story of life on earth is no exception: the fossil record tells us that many strange creatures once lived which are now extinct, and that there is no mark of human existence in the deeper sediments of time. But though it is very clear that life has changed over the ages, it is by no means clear how one type of life form could change into another.

Limits to Change

The biochemistry of even a relatively simple living organism is an extremely complex, integrated system. Any genetic change, or mutation, that affects the vital structure or functioning of this complex system, is far more likely to be fatal than beneficial; and the greater the effect of the mutation, the more certain it is to be fatal. Herein lies the first limitation to organic change: in order for a mutation to be survivable, let alone beneficial, it must only produce change on a small scale.

But in proposing a natural evolution from first cell to first fish, we have to explain a long series of very major changes: multicellular co-operation, diversification and specialisation of tissues, sexual reproduction, sophisticated organs such as gills and fins, a brain, and dozens more. That any of these biological advances could have occurred in one sudden change is inconceivable by any known mechanism. But reaching each advance via a long series of minor changes can also be difficult to conceive. This is due to the second limitation to which organic change is bound: the need for integration.

A single feature cannot continue to develop in a certain direction to the point where it disrupts the structure and functioning of the rest of the organism. As living things pass through higher and higher levels of complexity, they exhibit multiple changes in structure and function that work together. Different levels of complexity, which require major biological reconfiguration, cannot be attained through the development of single features in isolation:

Complex structures and systems are not free to vary independent of their relationships with other components of the complex.

Defining Evolution, *Reports of the NCSE*, 2001.

When we put these two limitations together – change must be small and change must be integrated – a weighty conundrum descends upon the idea of evolution: large-scale change cannot happen in one go, but neither can it result from a series of uncoordinated small-scale changes. In evolutionary biology this problem has been recognised as ‘the conflict between integration and evolvability’ (Kemp 2007).

Imagine starting with a small submarine or motorboat, and attempting to ‘evolve’ it into a four-wheeled motor car. There would be only two rules to this evolutionary exercise: 1) you can only make small modifications to existing structures, and 2) each modification must be functionally useful or of practical advantage. Using all your ingenuity, skill and forethought, you would still struggle to complete the task. By analogy, unguided natural evolution must achieve the more complex task of modifying a fish into a four-legged land animal, using only random mutations. Analogies are never perfect, but this simple thought experiment does focus the mind on the kind of practical difficulties inherent in transforming one fully functional complex system (a fish) into a completely different one (a tetrapod).

If the boat-to-car analogy is not convincing, then consider the real thing. Given the combined knowledge of modern biology, paleontology and genetics, the majority of educated people accept the standard teaching that the process of evolution has been essentially explained. Yet, if the process were truly understood, it should be possible to artificially replicate and accelerate transmutational events. No laboratory, anywhere in the world, using deliberately directed artificial selection, induced mutations, genome editing, or any other form of biotechnology, is able to transgenerationally evolve a tetrapod from a fish. We do not know how it can be done. Still, the world believes that natural selection could perform this organic alchemy simply through the accumulation of genetic accidents. Such is the strength of this belief that relatively few renowned thinkers and scientists have openly concluded that Darwin’s ‘numerous, successive, slight modifications’ is not a credible model.

Incredulity or Credulity?

First philosopher: “Because you do not understand the explanation, and cannot imagine it to be true, you believe that it *can’t* be true. This is the argument from personal *incredulity*.”

Second philosopher: “Au contraire, because you gullibly accept the explanation, and imagine it to be true, you believe that it *is* true. This is an argument from personal *credulity*.”

To answer the question, ‘What gave rise to white polar bears?’, the following facts are suggestive:

- The polar bear and the brown bear are genetically very similar and can occasionally interbreed.

- White variants naturally occur in some brown bear populations.
- White colouration is a common trait in many different animals living in open snowy landscapes.

Given this information a simple explanation may be hypothesised: the polar bear arose from white variants in an ancestral brown bear population, better concealed from prey in an ice age or Arctic terrain. Colouration is not the only physical difference between the polar bear and the brown bear; but all of the divergent features observed between these two closely resembling species are representative of small-scale change. There are no radical alterations to the essential structure and functioning of these large mammals. Modification at this simple level is not difficult to envision through the accepted principle of natural selection acting on naturally occurring variation.

A more difficult question would be, ‘What gave rise to all bears?’; and much more difficult still, ‘What gave rise to the first mammal?’ Standard evolutionary theory teaches that mammals arose from fish via a long series of intermediates. But the limitations imposed upon this transmutation, by the need for genetic change to be both small and co-ordinated, must apply to every step and feature. Mammals and fish are fundamentally dissimilar animals. Their locomotory, reproductive, respiratory and other physiological systems are constructed and operate in radically different ways. A theory of transmutation would need to explain, for instance, how breathing with gills in water converted into breathing with lungs in air.*

The problem of explaining the origin of mammals has been described by Kathleen Smith of Duke University’s Department of Biology as ‘a fascinating puzzle’:

Mammals are distinguished from other vertebrates by almost countless aspects of their anatomy, physiology, behavior, reproduction, and life history. Many of these features appear to have arisen as an integrated complex during the early evolution of mammals (Smith 2015).

How does an integrated complex of features arise through single, small mutations of minimal effect? Tom Kemp (2007) of the Oxford University Museum of Natural History describes the integration of mammal traits in this way: ‘...virtually every part of the organism is ultimately both dependent upon, and necessary for, the effective functioning of almost every other part, whether directly or indirectly.’ Kemp’s favoured solution is *correlated progression* in which each trait develops a little at a time and then waits for the other traits to catch up. But all such theoretical descriptive models – and there are several other competing ones – fail to address the mathematical challenges of mutation and selection rates.

How many mutations, and what kind of mutations, would be required to transform a reptile-like ancestor into a mammal? What are the mathematical probabilities of the right number and kind of mutations appearing in something like the right order, being selected and then fixed in something like the right order, and all in the available geological time? If researchers were to realistically attempt these practical calculations,

* The lungfish, as its name suggests, already possesses an air-breathing lung, as well as gills. However, the lungfish lung and the mammalian lung differ fundamentally in their anatomy, physiology and biomechanical operation. Instead of solving an evolutionary mystery, the lungfish poses two new ones: how could a lungfish-type lung gradually transmute into a mammalian lung, and how did the lungfish lung itself originate in the first place?

rather than assuming that beneficial mutations and time are in unlimited supply, the results might well prove unpalatable.

But these improbable odds have not escaped the attention of all in the field. Evolutionary researchers have always included a minority who have thought that some of the watershed transitions in the history of life are inconceivable in terms of the accumulation of small genetic changes. From the respected geneticist Richard Goldschmidt writing in 1940,

I cannot agree with the viewpoint of the textbooks that the problem of evolution has been solved as far as the genetic basis is concerned.

Through Stephen Jay Gould, that most troublesome of all evolutionary mavericks, challenging orthodox theory in 1980,

Many evolutionists now doubt exclusive control by [natural] selection upon genetic change within local populations.

To 'postmodern' contributors such as the paleobiologist Graham Bud speaking at a convention of evolutionary theorists in 2008,

When the public thinks about evolution, they think about the origin of wings and the invasion of the land... But these are things that evolutionary theory has told us little about (cited in Whitfield 2008).

And finally to theoretical biologist Gerd Müller proposing an *extended evolutionary synthesis* in 2017,

The real issue is that genetic evolution alone has been found insufficient for an adequate causal explanation of all forms of phenotypic [observable] complexity...

These outspoken few have helped to air an undercurrent of opinion that the potential for organic change brought about by the accumulation of small variations, must be subject to serious limitations. It must also be emphasised that none of these well qualified dissenters are meaning to imply that natural law evolution did not happen. But each has independently concluded that the universally taught theory of *how* evolution happened, by selection acting on continuous slight genetic modifications, is either inadequate, or, as some appear to suggest, totally inadequate. All have raised the requirement for some hitherto undetected mechanism, in order to understand how major organic change in the fossil record could have occurred.

The difficulty facing this candid minority is their perennial failure to convincingly demonstrate any such alternative mechanism for large-scale change. It is a situation that leaves the thinking world with three possible considerations:

- The orthodox view: The established process of modification by small increments is broadly sufficient, and as further details continue to emerge it will be shown to account for all the major transformations.

- The dissenting view: Additional genetic or other molecular processes need to be discovered or further researched. Highly complex life requires highly complex explanations, and as yet our understanding is too incomplete.
- The philosophical view: There may ultimately be no satisfactory scientific explanation. The assumption that all phenomena have natural causation may be wrong.

The great majority of science educators only alert their students to the first of these possibilities. The established theory of organic evolution, indeed science itself, cannot be suspected of failing on such an important central question about the world in which we live. Since any consideration of the other two possibilities would raise doubts, their very mention is prohibited. Rather, the conventional theory of gradual modification is treated as infallible, rendering any alternative propositions unnecessary.

The scientific establishment maintains this appearance of infallibility using a simple semantic trick. A small, easily explainable change, such as the derivation of white bears from brown bears, is given the same name – evolution – as an imaginary change requiring drastic physiological reconstruction. Tagged together, the two degrees of change are taken to be inseparable elements in the same universal process. Both are *called* evolution, so they are accepted with equal standing in the one big idea. There is a subtle deception at work here. The distinction between small changes that are easily conceivable, and major changes which are not, is being concealed.

Evolution as Fact

Geological remains testify that there were life forms abroad in previous times which are not found today. It is not simply that a few odd and peculiar species once lived in the past which are now extinct; whole ecosystems were entirely alien. In the Carboniferous (coal forming) period for example, the land flora was characterised by a wealth of unfamiliar clubmosses, horsetails and ferns of tree-like proportions, while our now abundant and diverse flowering plants seem to have been missing altogether. Time and again, the rocks reveal changing multitudes of animal and plant forms, on land and in water, varying in a larger or smaller degree to our contemporary forms. Using the comparative depths and ages of different rock layers, the fossils they contain can be recorded to make a chronological history of life on Earth. This is the *fact* of evolution: a pattern of organic change through the time span of our planet. The labyrinthian details of this history are always subject to interpretation and new findings; but an unfolding story of change – an evolution – remains an undeviating overview of the fossils.

The *theory* of evolution attempts to explain how and why these changes took place. It tries to identify what agencies wrought the bewildering variety of life forms past and present, what factors account for the distinct sequences of different fossils, and how the first organisms were created in the beginning out of non-life.* Confusion arises when some biologists affirm the theory of evolution as 'fact' or 'law'. The same word,

* It is a moot point as to whether abiogenesis – the origin of life from non-living matter – should be included within the purview of biological evolution. Scientists believe there is a continuum between non-life and life, in which case there can be no clear boundary between chemical evolution and biological evolution. Most student text books covering the broad span of evolution contain a section on the origin of life. However, many passionate proselytisers of Darwinism adamantly exclude discussion of first life origins – perhaps because they do not want to talk about it.

evolution, is assigned to both fact and theory, making the distinction between the two difficult to demystify. The fact of evolution, that life forms in the past were different, is an observation of concrete evidence dug from the ground. By contrast the theory of evolution, that all life forms descended from a single common ancestor by natural selection acting on natural variation, is not an observation of evidence but an *interpretation* of evidence. Evolution as fact, evolution as theory: one word, two very different meanings.

The distinction between fact and theory is obscured further by using the same word again (evolution) to describe small genetic changes in living populations. Well known examples of ‘evolution in action’ include mutation by pathogens, moths turning black in industrial areas, mice growing longer fur in cold stores, mosquitoes acquiring resistance to DDT, rapidly altering beak size in Galápagos finches, and grasses producing heavy metal tolerant strains. Such genetic adaptations to the environment are a not infrequent observation in the natural world: they are a fact. But the proposition that this kind of ‘evolution’ is all that is needed to explain the transformative journey from first cell to first fish, is theory not fact.

Evolution as Theory

The underlying central theory of evolution – and it is rightly perceived as theory not fact – is best understood by splitting it into two components. The first component is the principle of *universal common descent*, also known as *universal common ancestry*. This is the premise that the whole of biodiversity, living and extinct, descended by natural causes from one originally formed single-celled organism. The second component concerns the process or mechanism by which universal common descent could have happened. It is known as the *neo-Darwinian theory* or *modern evolutionary synthesis*, because it is an adding together of 19th century Darwinian natural selection to a 20th century understanding of genetic inheritance. The two components of the central theory are mutually reliant, for if no convincing mechanism can be shown, the initial premise of universal common descent exists unsupported.

All evolutionists accept the principle of universal common descent, because the alternative, that diverse groups of living things were independently generated, would appear to invoke the antithetical view of creationism. However, not all evolutionists leave the neo-Darwinian component of the central theory unchallenged. Part of the enduring charm of the Darwinian mechanism resides in its persuasively simple yet brutally powerful concept of ‘survival of the fittest’. But this persuasive and powerful concept may actually be quite impotent, if there is no material basis to which it can be applied. As this quote from leading developmental biologist Scott Gilbert seems to suggest, survival of the fittest is only half the problem:

Evolution needs a theory of body construction and change, as well as population construction and change. The modern synthesis is remarkably good at modelling the survival of the fittest, but not good at modelling the arrival of the fittest.

Interview with John Whitfield, *Nature* 2008

According to the synthesis, random genetic mutation provides the storehouse of new inheritable traits, and natural selection – or survival of the fittest – the means to fix and preserve them. But natural selection can only fix and preserve what is available, and

the old problem of the material basis for ‘body construction and change’ remains. Scott Gilbert is among several ‘high profile researchers’ looking to ‘extend or surpass the modern synthesis’ (Whitfield 2008). Gilbert’s province of developmental biology – how embryos grow and develop into adults – has long been a favourite hunting ground in the search for additional evolutionary mechanisms. There is hope that small changes in the genes controlling early development could have large effects on the structure of the adult; or perhaps discoveries will be made concerning the plasticity of gene expression in embryos. It has to be said, however, that after several decades of research, no revelatory mechanism of evolution has yet emerged from this area of study.

For as long as some evolutionary theorists and researchers doubt the adequacy of the neo-Darwinian theory, and continue to seek out additional or alternative scientific explanations, it cannot be agreed that evolution as a mechanistic process is essentially understood. The synthetic theory has endured since the 1940s, not because no one has challenged it, but because no one has come up with any better one. This does not mean that theory has become established fact; on the contrary, it tends to suggest that no fully convincing theory can be found. The *Oxford Dictionary of Biology* (2004, p600) notes that, ‘there still remain problems that cannot be explained entirely by Darwinian theory’.

In response to public scepticism that ‘evolution is only a theory’, scientists impress the point that a *scientific theory* is not a speculative guess. Rather, it is a well developed construct that is considered by consensus to be the *best possible explanation* for a group of facts or phenomena. When under challenge, the theory of evolution is characteristically defended as being ‘extremely robust’ and ‘one of the most powerful theories in science’. These are expressions of supreme confidence. But if the theory of evolution (i.e. the *one and only* theory) is so impregnable, how do we understand the following teaching guidance given by Eugenie Scott (1996), who at the time was Executive Director of the National Center for Science Education in the United States?

...scientists do not debate whether evolution (change over time, descent with modification) took place, though they vigorously argue how it took place – the processes, mechanisms, and the details of evolution.

We may speak of ‘theories’ (plural) of evolution, in the sense of the explanations for how descent with modification has taken place.

If scientists ‘vigorously argue’ about the processes and mechanisms of evolution, how can a single theory about the process and mechanism of evolution (i.e. the modern synthesis) be extremely robust; and how can it be *one* of the most powerful theories in science, if there are actually *many* theories about how descent with modification took place? Another Author, cell biologist Kenneth Miller, seems unaware of the contradictory implications of two statements he penned in the same paragraph:

Evolutionary theory is a vigorous and contentious field, just as a healthy science should be. Scientific meetings are filled with argument and disagreement, and that’s a good thing.

Evolutionary theory is a well-defined, consistent, and productive set of explanations for how evolutionary change takes place.

Kenneth Miller, *Finding Darwin’s God*, 1999, p54.

One wonders how a ‘well-defined’ and ‘consistent’ theory resolves out of a ‘contentious field’ that is ‘filled with argument and disagreement’. It seems that the power attributed to the theory of evolution lies more in the language than in the science.

A four page comment appeared in *Nature* in 2014 entitled, *Does evolutionary theory need a rethink?* For such a headline to be accepted in such a prestigious scientific journal is an indication of the seriousness of the question. The subtitle to this joint contribution, *Researchers are divided over what processes should be considered fundamental*, reiterates the lack of agreement between top researchers as to how the process of evolution actually works. Among the 15 leading scientific and philosophical contributors, one group answered ‘Yes, urgently’ to the question of a rethink, and the other group ‘No, all is well’ (Laland et al. 2014). Within the detail of the comment, however, it appears that the ‘yes’ proposers for an *extended evolutionary synthesis* had little to propose or extend, beyond the already appreciated fact that selection and expression of characteristics can be a two way process between organisms and their environments. Neither the ‘yes’ nor the ‘no’ camp described any new theory that might elucidate body reconstruction.

As already stated, the two components of the central theory (universal common descent plus the modern synthesis) are mutually reliant: one half of the theory cannot be robust if the other half is not. Evolution as a theory is not the ‘best possible explanation’ we have to fit the evidence: it is a conglomeration of many different and sometimes opposing theories.

Evolution as Belief

When science educators insist “evolution is a fact”, or even more emphatically “evolution is not a theory, it is a fact”, their intended meaning is difficult to penetrate. Surely the implication could not be that, in the complete study of evolution, everything that is proposed is proven fact and nothing is left to theory. In the teaching and understanding of evolution, some knowledge must be fact and some must be theory; but the ‘evolution is a fact’ educators prefer not to focus on where this distinction lies.

After several fossils of Java man and Peking man (now both known as *Homo erectus*) had been found between the 1890s and 1930s, most anthropologists had made up their minds that Southeast or East Asia was the region of the world where modern humans had evolved from ape-like ancestors. Following the discovery of many more fossils through the latter half of the 20th century, commentators began to portray it as a fact that this evolutionary change occurred in East Africa*. Until the last quarter of the 20th century it was taught as a fact that evolution was a linear path from ape to human; then, with the finding of even more fossils, it became a fact that hominin evolution was a bush, with *Homo sapiens* appearing at the end of one twig. A majority once assumed it was true that Neanderthal man did not interbreed with modern man, because there was little evidence to support it. Now, in the light of new DNA evidence, it is taken to be a fact that they did. This is how science progresses: things assumed to be fact based on evidence, turn out not to be when confronted with new evidence. Of course, these former assumptions were never proven facts in the first place, they were theories built

* The re-dating of modern human fossils from Morocco at over 300,000 years old, now raises questions about the ‘fact’ that modern humans first appeared in East Africa, or even in sub-Saharan Africa (Callaway 2017).

upon incomplete evidence. But theory treated as fact should be properly identified as something else: belief.

The fallacy of believing theory to be fact is not confined to theories about the details of human evolution, but applies to both components of the central theory of evolution. The first and primary component – universal common descent – is consensually taken on faith to be assumed fact. The principle of universal common descent, that all life descended from one original ancestor, is the bedrock of evolutionary theory. It is iconically symbolised by the *Tree of Life*, and is implicit in the whole idea of evolution regardless of arguments about the process. Common ancestry, or descent with modification, was the core argument used by Charles Darwin in his refutation of origin of species by special creation.

The assumption that universal common descent is a fact is clearly stated in this line from paleontologist Michael Benton in 2001:

All living things share the same family tree. This fact is backed by evidence...

The evidence Benton refers to is largely based on similarities, and many seemingly scientific conclusions are drawn upon it, such as this explanation of human development offered in *Discovery News* (2013):

Human embryos resemble those of many other species because all animals carry ancient genes. These genes date back to the origin of cells...

Similarity of embryos or genes among diverse forms may be suggestive of universal common ancestry, but is no hard evidence for it. As proponents of intelligent design argue, similarity is no less the signature of a common designer. The question of natural versus supernatural or intelligently guided origins may be a philosophical one, but the intelligent design argument asserts that observations of the natural world may be interpreted according to philosophical premise or belief. Oddly enough, the cases presented for universal common descent and intelligent design make use of the same evidence and the same laws of probability. The impartial philosopher must accept that there is no *proof* for either position.

The simplest form of life, such as a bacteria, is not in the least simple at the chemical level: it is a self-regulating system comprising hundreds of genes, hundreds of enzymes, and hundreds of interdependent reactions. It is also capable of both repairing and replicating itself. The coming together of such an integrated whole out of randomly disorganised molecules is a wildly improbable event. Imagining the process as a series of gradual chemical steps – as opposed to one single spontaneous leap – may seem to reduce its improbability, but not to overcome it. For this reason alone, many mathematically-minded scientists are inclined to accept the likelihood that life may have begun on Earth only once.

To suppose that any organism more complex than the simplest living cell could have arisen directly out of an organic chemical soup, would be to push the bounds of probability off the scale. As Swinnerton (1947) articulated, ‘...no generation arises spontaneously, but descends from a previous generation.’ So if simple life is likely to have arisen only once, and it is too implausible to suggest that any more complex life could have arisen directly from non-living matter, there really is no option but to accept the premise of universal common descent in any developmental theory. Universal

common descent is thus not so much the most probable material account of origins, as the *least improbable*.

There is no direct evidence for universal common ancestry: continuous links of gradual transmutations between all plant and animal groups do not exist in either living or fossilised form. Indirect support for universal common descent comes mainly from studies in molecular biology, comparing similarities in cell biochemistry, and in proteins and enzymes across all major divisions of life. The universality of the genetic code, through all plants, animals and bacteria, has long been granted to be the definitive evidence that all organisms alive today – we cannot be sure about all extinct forms – derive from common ancestry.*

The very same mathematical improbability and molecular evidence in favour of single common ancestry, may be construed in a very different way in support of theories of supernatural creation or intelligent design. The sheer implausibility of a living cell arising out of non-living chemistry by chance, and the absence of any substantiated physical or chemical laws able to account for it, are conducive to the view that such a feat of nature simply could not happen. Ever since Stanley Miller's famous amino acid synthesising experiments of the 1950s, science has aspired in vain to replicate the origin of life. The fact that no genesis of life has ever been observed in the natural environment, nor demonstrated in any laboratory, serves only to reinforce the belief that the building of life is the exclusive domain of a creative intelligence. As for the commonality of the genetic code, along with all other similarity evidence, this may be seen as a testament to the work of a common designer or single creator.

The creationist** will go on to argue that naturalistic theories concerning the building of further cell complexity, such as the first cell with a nucleus or the first sexually reproducing cells, are also reliant on highly improbable outcomes; and certainly there are no direct observations of such events. Creationism maintains, furthermore, that patterns of change in the fossil record do not accord with the principle of universal common descent, with higher groupings appearing suddenly and separately.

Without doubt, individual philosophical or religious views strongly affect how the 'scientific evidence' for evolutionary theory is evaluated. To a convinced atheist, chemical theories about first origins and biological theories about the early stages of cell evolution will sound less improbable and more plausible. But to those who consider the complexity of life necessitates a creative intelligence, all such theories are regarded as unproven hypotheses lacking empirical confirmation. The two equal positions of belief were recognised in the following extract from L. Harrison Matthews's 1971 introduction to a reprint of *The Origin of Species*:

The fact of evolution is the backbone of biology, and biology is thus in the peculiar position of being a science founded on an unproved theory – is it then a science or a faith? Belief in the theory of evolution is thus exactly parallel to belief in special creation – both are concepts which believers know to be true but neither, up to the present, has been capable of proof.

* Evolutionary biologists place great emphasis on the similarities between living organisms as evidence for evolution. This argument distracts from the real purpose of evolutionary biology, which is to explain how animals and plants became so different.

** I use the term 'creationist' in a broad sense. Genesis creationists, who believe that origins must accord with the literal word of the Book of Genesis, are only one group amongst a wide range of different beliefs engendering divine creation, intelligent design and vitalism.

Both components of the central theory of evolution – universal common descent and the modern synthesis – are theoretical ideas that, more often than not, are taken on faith to be scientific fact. Yet there is no scientific proof for either one, separately or together. The whole notion of evolution, as a naturalistic offering for the totality of life, is a position of faith or belief. When major theories about the origin and meaning of life are treated as fact, an academic system is not imparting good science, but indoctrinating unquestioned belief.

Blending Fact, Theory and Belief

The changing history of life on Earth shown by fossils, and the changing genetic composition of living populations, are both observational facts. The proposal that the latter fact is an explanation for the former, is a theory. Since the two facts and the one theory may all be defined by the one term – evolution – the distinction between fact and theory is easily lost when we speak of evolution. And when theory is *equated* with fact, the result is belief. We have, then, an imperceptible blending of fact, theory and belief in the subject of evolution.

Nevertheless, a sharp mind is able to detect when the subtle use of language is portraying theory as fact. Compare the difference in meaning between these two similar statements:

- Charles Darwin proposed a mechanism for evolution.
- Charles Darwin discovered evolution.

In the first, evolution by natural selection is being correctly recognised as a theory; but in the second, there is an assumption that evolution by natural selection is a fact.*

Authors and educators who claim or imply that evolution is a fact, are not helping students to understand the difference between theory and fact in science: they are simply promulgating their personal beliefs. The word ‘evolution’ can be applied to any context of fact, theory or belief, or indeed to any mixture of the three. This constant ambiguity and equivocation befuddles reality, making it extremely difficult to detangle science from pseudoscience. It is all too easy to manipulate the meaning of the word ‘evolution’, consciously or subconsciously, to create an illusion of fact out of what is really theory or belief.

Blending Replacement and Transmutation

Early in the twentieth century the history of social transportation underwent a major evolution from the horse and cart to the motor car. When we say that the horse drawn carriage evolved into the motorized carriage, naturally we do not mean that quadrupeds transmuted into combustion engines. There were never any bionic horses, part organic and part mechanical. We simply mean that cars replaced horses. By comparison, the history of life on Earth underwent many major evolutions. But does the fossil record illustrate these major evolutions as gradual, continuous transmutations between

* In truth, although the scientific establishment has honoured him with most of the credit, Darwin was neither the first person to think about evolution nor the first to write about natural selection. See Wainwright (2008) for a thorough research on the subject.

different life forms, or, like the horse and motor car, do they look more like sudden replacements?

When evolutionary biologists and paleontologists speak of ‘change’ in the fossil record, they are drawing no distinction in meaning between change by replacement and change by mutation. The words ‘transformation’, ‘transition’ and ‘evolution’ are equally opaque in this respect. The correct term to describe one type of living organism taking the place of another, in a particular locality or in a later geological period, is *replacement*; and the correct term to describe one type of living organism gradually mutating itself into a different type of organism, observed through the fossil record over time, is *transmutation*. By using these more precise terms, the muddled thinking created by the language of ‘change’, ‘transformation’, ‘transition’ and ‘evolution’ can be avoided. Once the distinction is accepted, it soon becomes apparent that replacement is the general pattern of change in the fossil record, and that transmutation is a very rare observation indeed.

As an example, we can look at the ‘evolution’ of vertebrates. Reptiles predominate among the remains of land vertebrates in the lower or older rocks grouped in the Mesozoic (middle life) era; while mammals and birds predominate in the higher strata and present day fauna that make up the Cenozoic (new life) era. In fact, the Mesozoic is commonly known as the ‘Age of Reptiles’, and the Cenozoic as the ‘Age of Mammals’. Although many reptiles have survived, they have been superseded in both abundance and diversity by the mammals and birds combined. This much is evolutionary fact, documented by the fossil evidence of successive rock strata, and by those animals living today. However, evolutionary theory goes a step further, and proposes that mammals and birds, before they greatly diversified and became predominant in the Cenozoic, evolved by gradual mutation out of reptiles or earlier reptile-like ancestors. To move from evidence of mere replacement to evidence of actual transmutation, the fossil history then needs to provide sequences of in-between mutations. Claimed examples of these in-betweens are commonly referred to as *transitional forms* or *intermediate forms*.

Most evolutionary sources maintain that transitional forms exist in their thousands. This statement on the education website *Understanding Evolution** (accessed 2018) is typical of the generally perceived view:

There are numerous examples of transitional forms in the fossil record, providing an abundance of evidence for change over time.

Yet 38 years earlier the influential theorist Stephen Jay Gould had conceded that this interpretation could no longer be sustained:

The absence of fossil evidence for intermediary stages between major transitions in organic design, indeed our inability, even in our imagination, to construct functional intermediates in many cases, has been a persistent and nagging problem for gradualistic accounts of evolution (Gould 1980).**

* *Understanding Evolution: your one-stop source of information on evolution* is a collaborative project of the University of California Museum of Paleontology and the National Center for Science Education in the US. Visit evolution.berkeley.edu

** Gould’s dissenting voice became more restrained and conciliatory in his later years, but he never retracted the establishment-rocking views he expressed in his more passionate days.

How is it that such strikingly different appraisals of transitional forms in the fossil record coexist in the scientific literature?

Although educational and research sources frequently discuss ‘transitional forms’ or ‘transitional fossils’ as evidence for evolution, remarkably, they rarely provide definitions for these terms. Among the scant definitions available, some are unhelpfully circular or tautological:

Transitional fossils are the fossilised remains of transitional forms of life that tangibly and demonstrably encode an evolutionary transition.

The Virtual Fossil Museum (accessed 2018)

Fossils or organisms that show intermediate states between an ancestral form and that of its descendants are referred to as transitional forms.

Understanding Evolution (accessed 2018)

In essence, both these definitions are informing us that a transitional form is a transitional form. And how do we know it is a transitional form? Because it is an intermediate state. And what is an intermediate state? A transitional form.

The next two definitions are more useful, though neither were obtained from the biological literature:

Transitional fossil: a fossil that exhibits characteristics of both ancestral and derived forms.

Merriam-Webster Dictionary (accessed 2018)

A transitional fossil is any fossilized remains of a life form that exhibits traits common to both an ancestral group and its derived descendant group.

Wikipedia (accessed 2018)

The latter definitions encapsulate the meaning of what a transitional fossil – or transitional form – is *assumed* to be: an organism that combines some distinguishing characteristics of its (presumed) ancestor, with some distinguishing characteristics of its (presumed) descendent. Yet this is no evidence of transmutation. To pacify the unconvinced, it is not enough to find fossils with a mix and match of ancestor and descendent characteristics: evidence for transmutation needs to be seen in the characteristics themselves.

One of the classic examples of a transitional form, *Archaeopteryx* (‘ancient wing’), illustrates this point. The educational website for the University of California Museum of Paleontology states that, ‘it has long been accepted that *Archaeopteryx* was a transitional fossil between birds and reptiles’ and that, ‘it is one of the most important fossils ever discovered’. Well preserved fossils show that *Archaeopteryx* had wings with full flight feathers, and that its tail and most of its body were also covered in feathers. The toothed jaw and long, bony tail, however, are typically reptilian. Although *Archaeopteryx* had a mixture of avian and reptilian features, none of its major features were actually intermediate between the two. The flight feathers appear very similar to those of modern birds, and are not transitional between a feather and a reptile’s scale. The bird-like wings are well developed and would have been capable of gliding flight, and possibly powered flight: they are not structurally in between a

wing and a reptile's arm or leg. Regarding its reptilian features, the toothed jaw does not show any signs of mutating into a bird's beak. The structure and functioning of the *Archaeopteryx* tail, though coated in feathers, is quite dissimilar to that of a living bird's, which consists of long flight feathers attached to, and controlled by, a specialised *uropygium* (rump). The tail is therefore not intermediate in terms of reptile and bird anatomy. In short, the *Archaeopteryx* fossils do not show any reptilian characteristics in the process of mutating into bird characteristics – there is no suggestion of transmutation.

It might simply be, that *Archaeopteryx* was a creature with its own unique medley of features – nature does not always conform to our artificial categories of classification. And so it is with most examples of so-called transitional forms: they have unique combinations of features, but demonstrate no actual transmutation in any of their features.

The current evolutionary tree places birds as branching directly from reptiles (dinosaurs), and both mammals and reptiles as branching from earlier *basal amniotes*. Members of this putative ancestral group are described in most texts as superficially resembling small lizards, with probably some reptile-like and some amphibian-like characteristics. Mammals can be recognised among vertebrate fossils by an assemblage of diagnostic features, including a single boned lower jaw with a characteristic hinge; teeth differentiated into incisors, canines and molars; a secondary bony palate; three bones in the middle ear; and a vertebral column divided into five distinct regions. The 'numerous transitional forms' view holds that:

The transition between mammalian forerunners... and the earliest mammals now includes many known intermediate stages (Rose 2006).

But these so-called 'intermediate stages' could not have been animals that were intermediate in their functionally viability. The mammalian ear, for instance, is an extraordinarily delicate and complex organ: to say that two bones migrated from the reptilian jaw to the mammalian middle ear, without being able to understand how transitional forms could chew or hear while these changes were occurring, is an absurd simplification. In another example, intermediate stages between the sprawling limb posture of a reptile or amphibian and the erect limb posture of a mammal, would have to be able to walk. Owing to such functional constraints it would be impossible for 'transitions' to appear as gradual continuums of single step mutations; and that is indeed why we do not see them, not because the fossil record is incomplete.

The expectation to discover thousands of transitional forms is arrested by a further difficulty. The transmutation of basal amniotes into mammals and birds would have to involve some major physiological changes; but fossils simply cannot provide evidence for many such mutations, because there is rarely any preservation of soft body parts. In mammals we would need to see how scales turned into fur, how sweat glands were formed, and how egg laying converted into live birth with milk suckling; then in mammals and birds how the complex physiological systems for being warm-blooded and achieving a higher metabolic rate developed. The mammalian system of breathing through a diaphragm, and the avian system of breathing via air sacs, are structurally and functionally very different; not only from each other, but from a presumed reptile-like ancestor. The change from a reptile-like three-chambered heart to the four-chambered heart of birds and mammals would require the simultaneous re-routing of the pulmonary (lung) arteries. As Steven Gould described in 1980, we cannot even imagine

how this combined mutation could happen. Fossils do not, and cannot, show intermediate mutations between complex organ systems made up by soft tissues.

Of course mammals and birds must have come from somewhere, and their descent from a common basal amniote is one hypothesis. Perhaps they did arise from reptile or reptile-like ancestors in some way, but fossil histories do not show how this happened. The sudden origins of mammal and bird characteristics illustrate the futility of attempting to use fossils to show transmutation. Whenever we take any higher category of organisms – be it starfish, beetles or flowering plants – chains of fossils showing gradual modification of new features from inferred group ancestors are conspicuous by their absence.

The word ‘evolution’, when used to denote trends in the fossil record, is ambiguous and misleading. It deliberately binds together, and conveniently fails to distinguish between, two completely separate meanings:

1. Replacement: the fact that different life forms appear and disappear through geological time, and that some life forms are substituted by others.
2. Transmutation: the theory that there must have existed a gradual and continuous chain of transitional forms linking all fossils.

This duality of meaning allows evolutionary teaching to perpetuate its primary illusion: that fact and theory appear indistinguishable.

Other terms used in the language of evolution help to ply this deception: ‘transformation’, ‘transition’ and ‘change’ similarly hide the distinction between replacement and transmutation. The terms ‘transitional fossil’ and ‘intermediate form’ fail to distinguish between organisms that simply show a unique mix of characteristics, and those that actually show characteristics in the process of mutating. The former are rare enough, but the latter are virtually non-existent.

But how are we to explain replacement, if not by transmutation? New life forms do appear abundantly at different points in fossil chronology, so where did they come from? All we can say from a scientific point of view is that direct evidence for transmutation is very weak, and that no other plausible explanation is currently available.

Speciation and the Origin of Species

The illustration of how white bears might derive from brown bears, earlier given, presents a general model of how any trait could diverge between two populations. By extending this model, it would be reasonable to conceive of several divergent traits accumulating to the point where two populations would be considered separate species. Such a process, whereby one specie* might diverge into two, is scientifically termed *speciation*. There are occasional claims in the scientific literature of speciation having been witnessed, but the complete process is normally thought to take thousands, if not millions of years.

* I use the singular form ‘specie’ in preference to the normal scientific nomenclature ‘species’, which does not differentiate singular from plural.

The title of Charles Darwin's celebrated work *On the Origin of Species* perpetuates the idea that 'evolution' and 'speciation' are synonymous, in that they refer to the same creative process in the history of life. Once it had been established that species could be mutable, popular assumption followed that the fountain of all biodiversity had been glimpsed. But just as the word 'evolution' amalgamates minor with major organic change, so the phrase 'origin of species' fails to distinguish between very similar and very different species. Some species are so similar as to require expert specialist knowledge to tell them apart, while others are so different as to confound any search for a likely common ancestor. In evolution it is not just the origin of species that needs to be considered, but the origin of families, orders, classes and phyla.

According to classical Darwinian theory, speciation may occur by natural selection: sub-populations living in different habitats are subject to contrasting environmental pressures, selection acts upon variation, and one specie becomes two. It is almost universally accepted (even among creationists), that the origin of closely resemblant species may be brought about in this way. It is not quite so widely accepted, even among evolutionary biologists, that this same mechanism can fully explain the origin of higher taxonomic groups:

The modern version of Darwinism, which incorporates discoveries in genetics made since Darwin's time, remains the most acceptable theory of species evolution. More controversial, however, and still to be firmly clarified, are the relationships and evolution of groups above the species level. *Oxford Dictionary of Biology (2004, p233)*

So the process of speciation may not be the same process that explains the origin of higher taxa, though Darwin himself made no such distinction. But the subject is complicated further by many authors who have claimed that the divergence of new species is a 'different problem' to that of evolutionary change without divergence:

The true meaning of the term "origin of species" was understood only rather recently. Not only were the pre-Darwinian evolutionists quite vague on the issue, but even Darwin himself seems to have considered "origin of species" the same as "evolution". Thus he confused two essentially different problems under the single heading "origin of species".

Ernst Mayr, *Animal Species and Evolution*, 1966.

Surprisingly though, natural selection may have little role to play in one of the key steps of evolution – the origin of species... Of course there is no question that natural selection plays a key role in evolution. Darwin made a convincing case a century and a half ago in *On the Origin of Species*, and countless subsequent studies support his ideas. But there is an irony in Darwin's choice of title: his book did not explore what actually triggers the formation of species... Speciation still remains one of the biggest mysteries in evolutionary biology.

Bob Holmes, *New Scientist*, 2010.

Speciation by means of adaptation to different environments is a beguilingly simple idea; but researchers in the field are familiar with an infinitely more complex reality. The population genetics of specie divergence theory requires advanced computer

modelling of multiple and diverse factors. Many other mechanisms are likely to be involved, including sexual selection, random genetic drift, polyploidy (the multiplication of chromosome sets) and hybridisation. These additional mechanisms may act singly, together, or alongside the traditional Darwinian mechanism of natural selection. Contention reigns over the relative importance and prevalence of each type of mechanism. There is also disagreement over the degree of genetic isolation necessary to commence or complete speciation, whether it need be geographical or ecological, or indeed whether isolation is necessary at all.

Disagreement and debate are healthy in science, but also give a clear signal as to the extent of our ignorance:

Called the “mystery of mysteries” by Darwin, speciation is still a little-understood area of evolution.

Jerry Coyne, *Nature*, 1992.

Although many theories and ideas have been offered up to account for speciation, it remains one of the big puzzles in biology.

Ian Stewart, *New Scientist*, 2003.

Note that authors openly confess that speciation is ‘little understood’ and ‘one of the biggest puzzles in biology’. In compartmentalising speciation as a little understood ‘area’ of evolution, these authors are able to pretend there is no such lack of understanding in the process of evolution as a whole. This is nothing short of scientific chicanery. No significant transmutation in the history of life, such as fish to amphibian or spore producing plant to flowering plant, could occur without passing through a chain of different species, and without the divergence of species. Given that the number of species ever to have lived on the planet is estimated in the order of one billion, how can biologists claim to have a credible explanation for the descent of so many species from a single common ancestor, while admitting ignorance to the process of multiplication of species? There is no dividing line between the processes of speciation and evolution, and if the one is a mystery then so is the other. We may go further, and say that if the origin of similar species is little understood, surely the origin of greater diversity – families, orders, etc. – remains an even bigger puzzle.

In solving that bigger puzzle, proposed mechanisms of speciation in addition to natural selection appear to be of little assistance. Sexual selection, for instance, is a common phenomenon in the animal kingdom, and is thought by many authors to have been a widespread cause of the profusion of species. It is believed to have produced or exaggerated features such as ornaments, bright colours, songs and courtship dances, which attract mates and increase the chances of reproduction. Be that as it may, these features serve no purpose in adapting a specie to exploit a new environment. We cannot say that sexual selection helped fish to develop lungs and legs, or insects to grow wings. Genetic drift, denoting changes to the gene pools of populations due to random events, is another mechanism invoked by speciation theorists. It can produce novel variation that is selectively neutral, but again, no adaptive features. Polyploidy and hybridisation are thought to have been important factors in the multiplication of plant species; but these mechanisms have so far not helped to explain the origin of the major plant groups.

I have brought to light four major problem areas regarding theory of process in the origin of species:

- The traditional Darwinian theory of natural selection acting on natural variation is generally accepted as one likely way in which new species can emerge; but some theorists doubt its adequacy in accounting for the divergence of groups above the level of the specie.
- Decades of detailed research expose the traditional Darwinian theory to be far too simplistic. The process of speciation appears to involve a variety of mechanisms and a complexity of factors, and is admitted to be poorly understood. The origin of more divergent groups must therefore be a matter of even poorer understanding.
- Both evolutionary biologists and popular science writers freely admit that the process of speciation is a little understood mystery, but do not admit that the process of evolution is likewise. This is an irrational stance, because an understanding of the process of evolution is impossible without an understanding of the origin of species.
- Non-adaptive mechanisms that could induce relatively minor differences between similar species, such as sexual selection, genetic drift, polyploidy and hybridisation, offer little insight into the origin of higher taxonomic groups, which are separated by radical adaptive differences.

The process of speciation, in so far as we understand it, including all its theoretical models and possible mechanisms, lacks the explanatory power to fully account for the divergence of species beyond those of close resemblance. It is therefore misleading to equate the origin of species with the origin of higher groups, or to assume small and large degrees of divergence are brought about by the same process, or to define all levels of origin by the common term *evolution*.

Microevolution and Macroevolution

Observable genetic changes in living populations are called ‘evolution’, and major changes in the fossil history of life are also called ‘evolution’. The controversy within biology, largely suppressed in the public domain, is whether these two different magnitudes of organic change result from the same, conventionally understood genetical processes.

In order to clarify the area of controversy, it serves best to dispense with the word ‘evolution’ altogether, and introduce some more precise terms that help us to engage with the problem rather than evade it.

As their prefixes suggest, the terms microevolution and macroevolution refer respectively to small-scale evolution and large-scale evolution. They are sometimes defined to mean short-term and long-term evolution, but this can lead to a confusing overview. The fossil record shows that only minor organic change may occur over very long periods of time, while significant change can occur relatively quickly. The more useful application of these terms is therefore in differentiating degrees of organic change, not degrees of time.

The field of microevolution brings together a whole range of natural phenomena that are known to alter the composition of a population's gene pool. The list includes mutation, natural selection, sexual selection, random genetic drift, interbreeding with other populations, and gene transfer by bacteria. Any instance of genetic change within a population may be defined as microevolution, whether speciation is the eventual outcome or not.

Macroevolution refers to patterns of change in the history of life, as evidenced by the fossil record. In studying these patterns of change, authors often refer to the emergence and extinction of 'species'; but macroevolution is really about the emergence of families, orders, classes and phyla. Under the assumption of universal common descent, macroevolutionary research attempts to build ancestral connections between these higher animal and plant groups, and to arrange them among the branches of the schematic tree of life.

With regard to an evolutionary mechanism, the majority view is that of a single process: macroevolution is simply what happens when you fast forward microevolution. The minority view is that organic change at the macroevolutionary level is much too radical and often too rapid to be explained entirely by known agents of microevolution.

It is important to define micro- and macroevolution precisely, to prevent the terms being used as loosely descriptive ideas that are no less ambiguous than the word 'evolution' itself. Those definitions provided by the *Oxford Dictionary of Biology* (2019) fulfil this requirement:

Microevolution – evolution on a relatively small scale, involving the emergence of new species, or groups below the species level, such as races and subspecies.

Macroevolution – evolution on a relatively large scale, involving, for example, the emergence of entire groups of organisms, such as the flowering plants or the mammals.

The above definitions pinpoint the boundary precisely: microevolution concerns genetic change at or below the level of specie, and macroevolution genetic change above the level of specie.* Few doubt that known microevolutionary processes could account for the emergence of new races, subspecies and sometimes full species; but some doubt that they could, on their own, account for the emergence of entire groups. By splitting the study of evolution into two levels – micro- and macroevolution – students are given the opportunity to think for themselves whether these terms represent one process or two.

But traditional dogma in evolutionary teaching does not permit this freedom. The majority view held among current researchers and educators would in no way differ from the view expressed by one of the leading developers of the synthetic theory, Ernst Mayr, in 1963:

* Personally, I would place the boundary one level higher, between genus and family, because I think this would more closely correspond to the level at which mere extrapolation of microevolutionary processes becomes more difficult to sustain.

...it is misleading to make a distinction between the causes of micro- and macroevolution. If used at all, these terms should be considered purely descriptive (*Animal Species and Evolution*, p 587).

Mayr's own contempt at even using these terms, was fuelled by his opinion that alternative genetic theories of macroevolution were 'deviant' and 'based on misconceptions of the actual course of evolutionary change'. Julian Huxley, who coined the term 'synthetic theory', had been more openly mocking in 1942. In response to Goldschmidt's criticism that explaining the radiation of Hawaiian finches by a series of microevolutionary changes was unimaginable, Huxley wrote, 'one can only reply that his imagination differs from that of many other biologists'. A similar sentiment was expressed by Colin Patterson (1978, p142) of the London Natural History Museum, in agreeing that an inability to envisage macroevolution as an extension of microevolution was 'due only to a failure of imagination'.

Imaginative of Imaginary?

First philosopher: "In science the transition from small-scale genetic change to large-scale morphological change is prevented only by lack of imagination."

Second philosopher: "I see, you mean the kind of imagination that produces good science fiction?"

The condescending deprecations of these influential men, and of other contemporaries, encouraged the attitude that alternative theories of macroevolution were not worthy of consideration, and generally put forward by people who lacked imagination and intelligence. Unfortunately, such belittlement of anyone suggesting possible limitations to the mechanisms of microevolutionary change, set the tone to be emulated by many of the leading proponents of neo-Darwinism thereafter. Confidence in the supremacy of the synthetic theory is still perpetuated today by a convention of assumed intellectual superiority. In the demeanour of Richard Dawkins (2006, p113), any suggestion as to the improbability of organic complexity being built by known microevolutionary mechanisms, should be dismissed as "an argument that could be made only by somebody who doesn't understand the first thing about natural selection".* In this manner a dogmatic style of teaching evolution has become the norm, presenting macroevolution via neo-Darwinian microevolution as a fact unchallengeable by any sane person.

Yet an attitude of contempt shown towards a minority opposition, especially in the field of science, gives a useful insight to the impartial observer. It strongly indicates that a resolute and exclusive belief in a particular theory is not simply propelled by a dossier of scientific evidence, but reinforced by a prejudiced emotional attachment. The student's task is therefore to separate the science from the sentiment.

* A misunderstanding of the argument is actually on the part of Richard Dawkins. The question of improbability is raised in regard to the origin of genetic material, not in regard to the action of natural selection.

The emergence of the theory of *punctuated equilibria** in the early 1970s not only reinvigorated the micro/macroevolution debate, but launched it into the headlines of the scientific literature and the popular media alike. In 1980, following this renewed contention, about 150 of the world's leading evolutionary theorists gathered at the University of Chicago for a conference entitled 'Macroevolution'. Attending this meeting was the news editor of *Science* journal, Roger Lewin, who was able to report the following:

The central question of the Chicago conference was whether the mechanisms underlying microevolution can be extrapolated to explain the phenomenon of macroevolution. At the risk of doing violence to the positions of some of the people at the meeting, the answer can be given as a clear, No!

Apart from the possibility of some members of the conference taking violent offence, Lewin also noted that 'the proceedings were at times unruly and even acrimonious'. Here was further evidence that the single process view of evolution, based on the modern synthesis and microevolution, cannot be defended without emotions getting the better of rationality.

After the commotion it stirred in the 1970s and 80s, punctuated equilibria simply became subsumed into a slightly qualified teaching of the old dogma. It was accepted that evolution progressed at different rates on a geological timescale, but still always according to neo-Darwinian principles. The top hitting education website *Understanding Evolution* reassures its global internet readers that:

Despite their differences, evolution at both these levels [micro and macro] relies on the same, established mechanisms of evolutionary change.
evolution.berkeley.edu (accessed 2018)

However, an examination of the published literature provides ample evidence of a schism continuing behind the scenes. Here is one example from the peer reviewed journal *Genetica*:

At the centre of disenchantments with the neo-Darwinian theory of evolution is the connection between micro- and macroevolution... The conceptual chasm between microevolutionary processes (inheritance, selection, drift) and macroevolutionary patterns appears to some authors to be deep, wide and unbridgeable (Arnold, Pfrender & Jones 2001).

This 'conceptual chasm' expressed by some published researchers as 'deep, wide and unbridgeable', is never mentioned by online teaching guides; nor in school biology curricula, museum displays, science and discovery news reports, television documentaries, nor any other opportunities for interface between academic science and public education.

Other scientific authors echo doubts about the ability of the microevolutionary to explain the macroevolutionary, though without using these terms. Such an example is

* Published by Niles Eldridge and Stephen Jay Gould in 1972, the theory of punctuated equilibria challenged the expected interpretation of steady, gradual change in the fossil record. Instead, as they proposed, the real pattern was one of sudden, rapid change followed by long periods of little or no change.

provided by professor of experimental genetics Bryan Turner in the journal *Frontiers in Life Science*:

Darwin claims, not least through the title of his most famous book, that natural selection provides a mechanism to explain the origin of species. But his data stem from the observation of small, incremental changes, either through the isolation of finches on particular Galapagos Islands, or selective breeding... But can this mechanism also accommodate the much greater phenotypic changes that lead to distinct species and higher degrees of separation? This remains a problematic question (Turner 2013).

Statements challenging the plausibility of microevolutionary extrapolation turn out to be not that rare in the scientific literature, once there is a will to look for them. Much harder to find, however, is the inclusion of these opinions in student teaching and public media. What is the motivation behind this tacit agreement not to expose uncertainty?

The answer can be found in Charles Darwin's own chapter *Difficulties on Theory*:

If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down.

On the Origin of Species, 1859

Charles deflected the threat of this objection by simply holding firm that he could “find out no such cases”. But patently there are others who have not shared in his confidence, and so the objection is sustained. Indeed, it is not the formation of any one complex organ by gradual modifications that is being questioned, but the formation of all such organs. Deep in the hearts of all evolutionists, of single process persuasion or otherwise, is the fearsome truth that no other plausible theory of macroevolution has been advanced. Without the neo-Darwinian theory there is *no* theory. To openly admit that the neo-Darwinian theory is inadequate in accounting for macroevolution, in the knowledge that no alternative theory is available, would be to threaten the whole existence of evolution as a credible science. This is why the modern synthesis is defended with strong emotion, why uncertainty is concealed, and why the illusion is maintained.

Merging Science and Philosophy

Biological evolution, however, is intended to exclude any role for supernatural intervention in the world because it assumes that natural forces by themselves are sufficient to create new species.

Peter J. Bowler, *Evolution: The History of an Idea*, 1989.

Those of a religious or spiritual disposition may feel that the existence of a god is ‘perfectly natural’. But in the origins debate between creation and evolution, the two concepts of ‘God’ and ‘natural’ are on opposite sides of the divide. In philosophy, and in science, the terms ‘natural’ and ‘supernatural’ have a particular meaning, and in order

to overcome muddled thinking it is important to define and understand these terms very clearly.

We understand the workings of our material world through ‘natural laws’, also known as ‘physical laws’ or ‘scientific laws’. They are called ‘laws’ because they are constant and predictable, and they are called ‘natural’ because they are founded upon observation of nature. If a coin slips out of my hand it will fall to the ground, and it always will because of the law of gravity. A supernatural phenomenon is something that acts beyond or above the natural order: it is a contradiction, intervention, or suspension of normal physical laws. If I release my coin and it remains suspended in the air, that would be a supernatural event.

A creator god whose powers transcend the natural order is by definition supernatural. As the architect of the natural world a creator would maintain its physical laws, but, having control over them, could also have the ability to intervene in the natural order through miracles. The degree of supernatural intervention and its implications for evolution is a question of debate between differing religious creeds.

But understanding the difference between the natural and the supernatural does not mean we can always distinguish between the two. If a terminally ill patient claims that their unexpected sudden recovery was caused by divine intervention, there is no way of determining whether their supernatural claim were true or whether the healing occurred through natural causes. But if God or God’s angels *were* capable of intervening in medical biochemistry, their intervention in the biochemistry of evolution could hardly be excluded.

The argument that there is no scientific evidence for the supernatural is circular, because the conclusion follows inevitably from the premise. Supernatural phenomena *by definition* do not conform to scientific laws. They are not predictable, testable or repeatable, and are therefore not amenable to scientific investigation. Nothing is to be achieved by searching for natural law where none can be found, and attempting to prove or disprove the supernatural using scientific methods is futile.

Lack of scientific evidence is not lack of evidence, however. A person who has experienced a miracle has personal evidence of the supernatural. There are instances where two or more people have witnessed the same miracle together, providing corroborated evidence.

Many commonly held philosophical or religious world views (whether or not people are fully aware that they hold them), including materialism, scientism, atheism, theism, creationism and vitalism, are rooted in either the denial or the acceptance of the supernatural. Each level of denial or acceptance determines how evolution is evaluated. There is a very important point to appreciate here: evolution is being interpreted and perceived according to pre-established philosophies, and not simply according to pure science. Evolution even has its own philosophy: evolutionism.

The debate between evolution and creation is really a debate about the natural and the supernatural. Can the wondrous diversity of life on Earth be explained entirely by natural laws, or does it require some direct input from a supernatural cause? There can be no doubt that a person’s acceptance or denial of the supernatural strongly influences the way they interpret evolution.

Cosmic Evolution

In a mechanical universe in which every natural event is the result of previous events, the unfolding cosmos may be regarded as an expanding chain reaction of cause and

effect – a single, unbroken immensity of action and reaction, generating over time the epic story of *cosmic evolution*. The American Physical Society’s website *Physics Central* (accessed 2018) explains the breadth and meaning of cosmic evolution in this way:

...the vast number of developmental and generative changes that have accumulated during all time and across all space, from big bang to humankind.

In this deterministic world view, the development of life on Earth is not seen as a separate phenomenon, but as a predictable continuation of a stream of events viewed on a grander timescale. Life did not begin with organic molecules, and nor did it begin here on Earth. It began in the stars:

The nitrogen in our DNA, the calcium in our teeth, the iron in our blood, the carbon in our apple pies were made in the interior of stars. We are made of starstuff.

Carl Sagan, *Cosmos* 1980

But a cosmic view of evolution has never been restricted to physicists and astronomers. The notable zoologist and early neo-Darwinist Julian Huxley (1953) considered that confining the term ‘evolution’ to mean only transformations of living substance was ‘undesirably narrow’:

From the condensation of nebulae to the development of the infant in the womb, from the formation of the earth as a planet to the making of a political decision, they are all processes in time; and they are all interrelated as partial processes within the single universal process of reality. All reality, in fact, is evolution...

On this cosmic scale of thought, the word *evolution* is no longer limited in meaning to the origin of varied life on our one planet, becoming now the name given to a universal material process that appears to reveal the origin of all existence.

But in its voyage of discovery to understand all of existence, the enterprise of cosmic evolution confronts us with a strange paradox: in achieving ever increasing amounts of knowledge, we become aware of ever increasing amounts of ignorance. Every step of science gained, pushes the horizon of omniscience further in retreat:

We live on an island surrounded by a sea of ignorance. As our island of knowledge grows, so does the shore of our ignorance.

John Archibald Wheeler, physicist (1992)

The solution to the paradox, ever more strangely, lies within a second paradox: as a purely scientific pursuit, the study of cosmic evolution excludes consideration of any supernatural or divine higher consciousness; yet it is the pursuit of that higher consciousness that has rewarded many with a greater understanding of all existence.

The belief that life, the universe and everything can only be understood through the perspective of science, is an illusion. It is the grandest illusion of them all, and it goes by the name of evolution.

Atheistic Evolution

No scientifically qualified intellectual has striven harder to bring into public consciousness a convergence between Darwinian evolution and atheism, than Richard Dawkins. His two most familiar bookstall titles, *The Selfish Gene* (1976) and *The God Delusion* (2006), have been hugely influential in crystallising modern Western thinking about the meaning of life.* Richard has played no small part in establishing the now widely held social belief that all characteristics of life, including much of human behaviour, are attributable to the selective advantages of individual genes; advantages that can be separately revealed, it is further believed, by scientific enquiry. Darwinian survival, according to this reductionist premise, therefore determines each specific reason for the existence of every facet of the living world. Since genes arise by random means, and are selected by the vagaries of the environment, all organisms appear to have been constructed by chance events that cannot be construed as belonging to any overall cosmic design or plan. It requires only one more step in this logical progression to arrive at the conclusion that there is no place for a creator god.

Richard Dawkins uses evolution by natural selection as a mainstay in his argument as to ‘why there almost certainly is no God’:

Natural selection not only explains the whole of life; it also raises our consciousness to the power of science to explain how organized complexity can emerge from simple beginnings without deliberate guidance (*The God Delusion*, p116).

His cause is to prove, at the very least, that the existence of a creator god is *not required* in order to explain the origin and diversity of life. However, Richard’s statement makes two fundamental assertions of doubtful consensus. Many scientists would dispute that natural selection (by itself) could explain “the whole of life”, and many would contend that science is still struggling to explain how life’s organised complexity emerged. Richard Dawkins’s case against the existence of an intelligent creator is therefore not a well supported scientific argument, but merely an advocacy for atheism disguised as one.

But Dawkins was by no means the first evolutionist to publicly promote Darwinism as evidence to support an atheistic world view. Speaking on television in 1959, Julian Huxley declared that:

Darwinism removed the whole idea of God as the creator of organisms from the sphere of rational discussion. (Cited in Hitching 1982)

After a career in biology and evolution spanning more than 70 years, the august Ernst Mayr (2000a) concluded:

First, Darwinism rejects all supernatural phenomena and causations. The theory of evolution by natural selection explains the adaptedness and diversity of the world solely materialistically. It no longer requires God as creator or

* In a 2017 poll to celebrate the 30th anniversary of the Royal Society science book prize, *The Selfish Gene* was voted the most influential science book of all time (*The Guardian* 20 Jul 2017).

designer (although one is certainly free to believe in God even if one accepts evolution).

After asserting that Darwinism “no longer requires God as creator or designer”, Mayr’s proviso permitting one the freedom to believe in God (as creator or designer?) is nothing more than a sop to appease religious believers. No doubt many believers have been confused by the ambiguity and disingenuousness of Mayr’s words. But there is no ambiguity regarding his own personal views: “I have the honesty to say I’m an atheist. There is nothing to support the idea of a personal God.” (Mayr 2000b).

Most scientific theories are not advanced on the basis of their dispensing with God, but on the basis of their reliable science. In the case of evolution the science is somewhat inadequate, so the god argument is offered for additional support. The discussion then becomes turned on its head, and the argument from atheism begins to eclipse the argument from science. Highly influential evolutionary theorists of the calibre of Dawkins, Huxley and Mayr, have embraced evolution’s materialistic assumptions, and, to a greater or lesser extent, used them to promote atheism to a popular audience.

Only a small minority of evolutionary biologists publicly proclaim their atheism, and fewer still actively campaign against religion in the school of Richard Dawkins. But the great majority appear to harbour sympathies in that direction. Christian biologist and author Kenneth Miller (1999) was in no doubt when he wrote:

Over years of teaching and research in science, I have come to realize that the presumption of atheism or agnosticism is universal in academic life.

The connection between neo-Darwinian theory as an explanation of life, and atheism as a philosophy of life, is an obvious one. After all, it was the very aim of Darwin’s thesis to oppose and replace ideas of divine creation with an account of life’s origins according to natural laws alone. Whether it succeeds in that objective is another matter.

The ideological marriage between Darwinism and atheism turns evolution into something of far grander pretensions than humble science. As with cosmic evolution, atheistic evolution enables the word ‘evolution’ to assume the mantle of an entire world view. Once embraced as a personal philosophy, atheistic evolution becomes part of the adopter’s self-identity, to be defended with an emotional commitment as strong as any religious affiliation. Even moral principles will be justified on the basis of evolutionary pretexts, such as greater compassionate treatment shown to animals *by virtue of* their commonality of descent with humans. An educator (such as Richard Dawkins) who holds strong atheistic convictions, is unlikely to be teaching evolutionary science without prejudice – theory and belief will be presented as truth and fact. Of course, for the committed atheist, evolution needs to be a fact.

Theistic Evolution

Every protagonist who proclaims that evolution proves there is no God, is matched by an adversary who proclaims that it does not. *Theistic evolution*, also known as *evolutionary creation*, is an attempt to harmonise Creation by God – usually the Judeo-Christian or Islamic versions of Creation – with the scientific theories of cosmic and organic evolution. In essence, theistic evolution presents a simple compromise: the processes of evolution were initiated and/or guided by God, as part of God’s intended

plan for the universe. There is no single explanatory narrative for this religious belief, since the great diversity of denominational teachings and traditions may be interpreted in particular and sometimes very personal ways. However, all theistic evolutionists are united in their conviction that evolution is a scientifically proven truth. The neo-Darwinian theory, as an explanation for universal common descent and for macroevolution, is considered to be an evidence-based and unchallengeable fact. Theologically speaking, evolution need not be regarded as a diminution of God's power, but positively embraced as a manifestation of God's great work. The Designer need not resort to 'special creation' when clever enough to predetermine events using 'creation by law'.

The evolutionary creation website *BioLogos* states that God 'crafted' evolution to create biodiversity, and that 'God governs and sustains all natural processes'. Given that mass extinction events are also natural processes, it must follow that God is not only the creator of biodiversity, but also its destroyer.

There could be no more venerable role model for 'evolution by God' than the mid-twentieth century geneticist Theodosius Dobzhansky, who helped to formulate the modern synthesis and originated the famous quotation, "nothing in biology makes sense except in the light of evolution":

It is wrong to hold creation and evolution as mutually exclusive alternatives. I am a creationist and an evolutionist. Evolution is God's, or Nature's, method of Creation (Dobzhansky 1973, p127).

But in equating God with nature, Dobzhansky's belief is suggestive of a *deistic* or *pantheistic* divinity: one that created or maintains the natural order, or is part of it, but does not intervene.* This is quite different to the personal *theistic* god of Christianity, who does intervene with miracles. It is much easier to harmonise naturalistic evolution with a remote, impersonal god, than with an interactive theistic one.

In order to reinforce the stand against various creationist and Intelligent Design groups who campaign strongly *against* the teaching of evolution as proven science, it is often pointed out by leading educators in the United States that, "Most Catholic and mainline Protestant denominations have accepted evolution as the way God brought the world about." (Eugenie Scott 1996.) However, this widespread church acceptance must leave many congregations confused about the relationship between God and evolution. The established finding of scientists is that evolution is an unguided process with no predetermined goal, and that human beings appeared on Earth as a matter of contingency or luck. This finding was succinctly aired by paleontologist and co-developer of the modern synthesis George Gaylord Simpson, in his 1967 book *The Meaning of Evolution*:

Man is the result of a purposeless and natural process that did not have him in mind.

When evolution is found to have no purpose or plan, that can only mean no purpose or plan of God's; and when man is found to be not in mind, that can only mean not in the mind of God. In today's evolutionary parlance, the human specie is simply 'an ape that

* For a discussion on Dobzhansky's religious views see Jones (2006).

got lucky'. How does this element of luck align with the Christian tenet of humankind being specially created in God's image and likeness?

These contradictions are only the first in a long list. The matter of supernatural intervention is another serious problem. If we were to allow that God set in motion the process of evolution, or breathed life into the first living cell, or added a soul to an ape to complete a human, then nothing is to prevent us from suggesting there were other interventions, and we no longer have a scientific theory. Concerning the human soul itself, science does not validate its existence, and evolution insists that *all* elements of human nature have Darwinian origins.

In advocating agreement between religion and science, BioLogos distinguishes between evolution and evolutionism:

But while we accept the scientific evidence for evolution, BioLogos emphatically rejects Evolutionism, the atheistic worldview that so often accompanies the acceptance of biological evolution in public discussion. Evolutionism is a kind of scientism, which holds that all of reality can in principle be explained by science. In contrast, BioLogos believes that science is limited to explaining the natural world, and that supernatural events like miracles are part of reality too.

BioLogos, biologos.org, accessed 2021

Niggling anomalies project from this seemingly rational statement:

1. Supernatural intervention in origins is not being discounted, only moved further back in time to the point of Creation.
2. If continuing supernatural intervention is accepted, as in miracles, there can be no position of knowing when and how those interventions occurred during the life of the universe or the history of the earth.
3. Evolution and evolutionism are based on the same naturalistic premise, that all phenomena and events have natural causation. The one cannot be rejected on the grounds that it excludes the supernatural without rejecting the other.

Similar contradictions are seen in the creed of the Catholic Church, which purports to concur with the science of evolution yet allows certain exclusions for humans. The acceptance by the Catholic Church in 1950 of evolution as a legitimate scientific enquiry, is often marked by theistic evolutionists and by science educators as a significant turn in the tide against belief in special creation. But the Church's position on evolution, and especially on human evolution, is not as liberal as many would like to entertain. According to an officially censored tract *Adam, Eve, and Evolution* (2004) on the website *Catholic Answers* (updated 2018):

Concerning biological evolution, the Church does not have an official position on whether various life forms developed over the course of time.

Concerning human evolution, the Church has a more definite teaching. It allows for the possibility that man's *body* developed from previous biological forms, under God's guidance, but it insists on the *special creation* of his *soul*.

While the Church permits belief in either special creation or developmental creation on certain questions, it in no circumstances permits belief in atheistic evolution.

Note that the Catholic Church ‘does not have an official position’ on the evolution of life forms, only allows for the ‘possibility’ that man’s body evolved, and ‘permits belief in either special creation or developmental creation’. These statements hardly express a strong commitment to naturalistic evolution, and retain certain doctrines that remain in opposition to it. The tract continues, ‘it is impossible to dismiss the events of Genesis 1 as a mere legend’ and ‘it is equally impermissible to dismiss the story of Adam and Eve and the Fall (Gen. 2-3) as a fiction’. Evolutionary science emphatically does dismiss the events of Genesis 1, and does not support the idea that all humans descended from a single pair (Adam and Eve).*

Those who claim they have ‘no problem’ in accepting Creation by God *and* evolution, certainly do have a problem in providing rational solutions to the above contradictions. Attempts to incorporate evolutionary theory into supernatural tradition, such as the following from Jesuit moral theology lecturer and author Jack Mahoney (2011), simply present comforting narratives that continue to avoid the list of logical objections:

Primarily, however, the evolutionary achievement of Jesus was to confront and overcome death in an act of cosmic significance, ushering humanity into the culminating stage of its evolutionary destiny, the full sharing of God’s inner life.

The achievements of Jesus and humanity’s divine destiny cannot be conflated with biological evolution simply by adding the word ‘evolutionary’. The belief that Judeo-Christian theology can be reconciled with a science-based, naturalistic approach to evolution must be admitted to be a delusion.

<i>COGNITIVE DISSONANCE BETWEEN THEISM AND EVOLUTIONISM</i>	
<i>Example: Christianity as Non-Complementary to Darwinian Scientism</i>	
<i>Christian Belief</i>	<i>Darwinian Belief</i>
God is real and living, and we experience God through prayer, meditation and revelation.	Everything we experience is the result of natural laws acting through our genes and our environment. There is no need to invoke mystical or supernatural forces acting beyond the reach of science.
God created the world and its life forms for a reason: a purpose.	Evolution is blind, brutish and aimless. The course of evolution is contingent upon unpredictable events, so there can be no goal or purpose.

* In common with many journalistic headlines, the announcement of ‘Mitochondrial Eve’ in 1987 was only a partial truth. It may be that all humans carry the marker of one ancestral woman, but that does not mean they are descended from one woman only. Everyone inherits their mitochondrial DNA from their maternal grandmother, but that does not mean we only have one grandmother.

Humans were created in God's image and likeness, and are divinely empowered to have dominion over the earth.	There was no preordained plan directing what physical and mental qualities humans would have, or even that humans would appear at all. Humans are not 'special', they evolved just like every other animal.
People have a soul/consciousness that is implanted by God and survives death.	Consciousness is a fabrication of the brain, and the brain developed according to Darwinian laws. When the brain dies so does consciousness and the 'soul'.
God gave everyone freewill to choose the path towards God, or not.	Freewill is a delusion created by the brain. All our behavioural responses are determined by physical and chemical processes in the brain interacting with the environment.
Morality comes ultimately from God.	Most morality is constructed through social contract, but some is adaptive and resides in our genes.
The purpose of religion is to teach about God and how to live according to God's ways.	Religion, whether culturally or biologically determined, serves to aid social cohesion and the survival of the group. Supernatural elements are delusional.
Jesus was conceived to a virgin mother and was raised from the dead after execution.	Conception without fertilisation is biologically impossible in humans, and resuscitation several days after death is not viable.

Theistic evolution is an oxymoron: the 'theistic' half is looking for evidence of a living, interacting god, and the 'evolution' half is looking for scientific evidence to explain all things without the need for a god. The supernatural is being invoked or excluded where it is convenient to do so: invoked in the creation and direction of natural laws, and excluded in the creation and direction of biodiversity.

There is no less of a disparity concerning so-called 'atheistic religions'. In the case of Buddhism, for instance, science does not accept the law of karma or the principle of reincarnation. All religions contain supernatural or metaphysical interventions that are incompatible with science-based evolution.

True harmonisation between the spiritual and the material is not achieved by compartmentalising dissonant thoughts, but by recognising the limitations of the scientific paradigm. Once the unrealistic pretensions of science are realised, the contradiction between the spiritual and the material falls away. The scientific endeavours of cosmic and organic evolution have failed to provide satisfactory rational explanations for any of the ultimate mysteries: the origin of the universe, the origin of life, the origin of biological complexity, most of the workings of the human mind, or for consciousness itself. It may be the aspiration in science to understand all things according to predictable laws, but an aspiration it will always remain.

The theistic evolutionist has haemorrhaged a little too much faith into evolution, having been deceived by its grand illusion. When evolution is accepted as 'the way God brought the world about', it then becomes adopted as the new Creation Story. Once scientific and religious beliefs are conflated, evolution doubles in potency as an explanation for the origin and meaning of life. A strong emotional attachment may then

take root. I remember attempting to discuss weaknesses in Darwinian theory with one scientifically minded member of the Anglican clergy, only to be taken aback by the vehemence of his defensive tirade. I realised that I was not just questioning the science, but rumbling the foundations of this person's belief structure.

These philosophical forays into cosmic evolution, atheistic evolution and theistic evolution, are intended to show that the idea of evolution does not exist in a vacuum of pure science. Few people have the curiosity or the determination to rigorously examine the evidence in support – and more importantly not in support – of the Darwinian account of origins. More often than not, evolution is accepted on faith and interpreted to fit in with the preferred belief system. But once assimilated and crystallised into firmly held opinions or convictions, the emotional defence of evolution can take precedence over the rational.

No science, even when its subject matter is as concrete and objective as that of geology and biology, can escape the influence of the social theories, ethical opinions, philosophical or religious conceptions of the day. On the other hand, every scientific idea... is bound to exert... a distinct influence upon the discussion of problems, material, ethical, social or philosophical, which are foremost at the time in the minds of men.

The Theories of Evolution, Delage & Goldsmith, 1912.

Summary and Conclusions

The word 'evolution' can mean all things to all people: an unimportant classroom topic to be forgotten after achieving an exam grade, or the most important idea ever to emerge in science that explains the total meaning of life; a thoroughly tested scientific principle, or a travesty of science; the final proof that God does not exist, or the wondrous incarnation of God's creative power.

Further, the term 'evolution' is applied to a hugely diverse range of phenomena and principles in science. Evolutionary narratives frequently slip between different meanings, and, indeed, the whole language of evolutionary teaching is often ambiguous and equivocal.

All mainstream academic and educational institutions teach young people that evolution is an emblem of scientific truth, achieved through the gathering of 'powerful' evidence. What they do not teach, is that the pseudoscience associated with evolution is also very powerful, and that the emotional, social and career pressures attached to the word are even more so. Evolution is so much more than just a purely scientific theory.

We live in a material world in which everything is constantly changing and evolving, and the course of biological diversity is no exception to this universal trend. There *is* a mountain of concrete evidence to show that different life forms have appeared and disappeared through the fossil record. However, no similar weight of evidence exists to show how fundamentally different life forms could have changed, *one into the other*, across increasing levels of complexity. The scientific theory of evolution cannot be accepted simply on the basis that everything changes. Nature imposes limits and rules to change, especially in complex biological systems where stability is maintained by a multitude of checks and balances. We need to distinguish between changes that are conceivable and those that seem rather implausible.

Exactly how small-scale change translates into large-scale change has always been a difficult issue for Darwinian evolution; and continues to be so. At the molecular level biological systems are so complex and intricately balanced, that only the smallest of genetic changes can be accommodated without compromising the viability or fitness of the living whole. When trying to imagine how large-scale evolution could work – i.e. the transformation from first cell to first fish – the problem lies in explaining how a set of holistically functional, interdependent body parts (i.e. a whole fish) could be constructed and brought together by means of single, step by step, small mutations.

There have always been a minority of geneticists, paleontologists and developmental biologists (among others), who have been willing to concede that a fully satisfying mechanism for large-scale organic transmutation has yet to be discovered. But in the sphere of public education, these doubts are rarely allowed to be expressed or explored.

The changing history of life on Earth shown by fossils, and the changing genetic composition of living populations, are both observational facts. That the second observation supplies an explanation for the first, is the basis of a theory. But since ‘evolution’ combines the two facts and the one theory into a single idea, the line between fact and theory is easily blurred. Difficulties with theory are papered over by calling everything ‘evolution’, and then simply repeating that ‘evolution is a fact’.

Although portrayed in public education as a single, well supported theory, the science of evolution is in reality a large collection of many different and sometimes competing theories, generally fuelling much controversy and debate.

Academia assures us that ‘evolution happened’, and that scientific disagreement only focuses on ‘how it happened’. But the ‘how’ cannot be dismissed as a subordinate detail. It was an understanding of how evolution could have happened, popularised in 1859 by Darwin’s exposition on natural selection, and buttressed by insights into genetic inheritance in the following century, that made the whole idea of the living world as a natural development a plausible proposition. If there are still fundamental questions about *how* evolution could happen, there must still be fundamental questions about *whether* evolution could happen.

A scientific education indoctrinates us that evolution is ‘an extremely robust theory’ supported and proven by ‘an overwhelming amount of evidence’. But scepticism remains among some who, contrary to the accusation that they ‘do not understand evolution’, have a very thorough understanding of it; those with a cogent but open-minded familiarity with the difficulties of the neo-Darwinian theory, recognising that science has come up short; and those with a good command and judgement of mathematical probability, realising that the random components of the modern synthesis rely on extremely improbable outcomes. The evidence that mainstream evolutionists find ‘overwhelming’, is interpreted by evolutionary sceptics in a completely different light:

- The random coming together of organic chemicals to create a unicellular organism is absurdly improbable, and cannot be demonstrated.
- The building of more complex organisms by accumulation of single mutations is not only improbable, but inconceivable.
- ‘Transitional forms’ that show a mix and match of characteristics, do not show transitions between the characteristics themselves.

- Mechanisms of speciation are poorly resolved, and there are serious theoretical difficulties in applying models of speciation to the origin of groups above the specie level.
- Microevolutionary phenomena that alter the proportions of genes in animal and plant populations, do not explain macroevolutionary trends in the fossil record.
- If it is doubtful that the modern synthesis can account for macroevolution, and no other convincing theory is available, then the principle of universal common descent has no explanatory support.

When educators ignore or dismiss these difficulties, they are neither exemplifying how scientific thinking should be conducted, nor encouraging a spirit of free enquiry.

This is how the illusion of the word ‘evolution’ works: by associating the label of evolution with a collection of events, observations and facts which are real, the theoretical and imaginary associations are then also assumed to be real. So many layers of chaff have grown around the kernel of evolutionary belief, nurtured by science, by education, by mythology, and by the entertainment industry, that it is all too easy to forget that no solid evidence has ever been procured to substantiate its germ principle: that the major groups of plants and animals arose by gradual transmutation, one from the other, and by a process which we presume to understand.

An illusion that manages to convince the most intelligent of minds that the inconceivable and the indemonstrable really did happen, is an elaborate illusion indeed. No false construct, however, can be sustained through many decades of scientific rigour without the *will* to sustain it. Darwinism arose out of the Enlightenment movement, favouring the supremacy of rational thought and scientific learning, and freeing the individual from the tyrannies of religious dogma and superstitious tradition. But in the process of social change the true meaning of enlightenment, as a spiritual or mystical revelation, became debased. The cosmic evolutionist now believes that science is the *only* way to comprehend the meaning of the universe, and the atheist believes evolution proves there is no god. Even the theistic evolutionist, who struggles with the full ramifications of evolutionary theory, is moving the balance of faith from the spiritual to the material. But when faith in science reverts to blind faith, to the extent that the failure of a major theory is denied and concealed, the Age of Reason has already passed its zenith.

So why do soundly educated, critical thinking intellects accept the neo-Darwinian theory as proven science? From a rational point of view, the theory does explain microevolutionary change and to a limited extent speciation. Its insufficiency in explaining macroevolutionary change is overlooked because no plausible alternative theory available. Science is founded upon the naturalistic assumption – i.e. there should be no need to invoke the supernatural – and a logical-sounding naturalistic theory based on a degree of evidence is preferable to no naturalistic theory at all. Neo-Darwinism thus becomes adopted as the ‘best possible’ explanation.

But there are also emotional reasons. For a scientific researcher or educator to openly refute core evolutionary theory, is to invite ridicule and isolation as a ‘creationist’. Once branded in this way, career and funding opportunities may be quickly withdrawn from the dissenter. Fear and peer pressure are therefore strong motivations not to question the ruling establishment.

Finally, consider the insatiable global trend for displacing faith in the spiritual with faith in science and scientism – the growing conviction that science is the only valid form of knowledge and understanding. Among those who adamantly deny the possibility of any divine or creative super-intelligence, evolution becomes the default position regardless of any gaps in its explanatory resolution. Under atheism, there simply is no other option but to accept evolution. To an increasing number, this is what the word *evolution* has come to signify: a personal and public affirmation that all of creation can be explained without the need for a creator. Those who are willing to embrace this materialistic philosophy are more than willing to embrace the ‘science’ of Darwinism, and to overlook its many shortcomings and contradictions.

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