

# Does Homology Provide Evidence of Evolutionary Naturalism?

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## Abstract

*Homology involves the theory that macroevolutionary relationships can be proven by the similarity in the anatomy and physiology of different animals.*

## Summary

Since Darwin, homology has been cited in textbooks as a major proof for evolution. A review of the literature on homology indicates that the theory does not provide evidence for evolutionary naturalism, and that the common examples of homology can be better explained by Creation. Furthermore, increased knowledge about the genetic and molecular basis of life has revealed many major exceptions and contradictions to the theory which, as a result, have largely negated homology as a proof of evolution.

Extensive comparisons of skeletons, muscles, nerves, body organs, cell ultrastructure and biochemistry of different animal kinds have confirmed that a great deal of similarity exists in both their structure and function. By arranging or classifying large sets of anatomical structures according to the similarity of selected traits, evolutionary naturalists have attempted to demonstrate evidence for a long, gradual line of progressive animal changes terminating in the highest organism yet, humans. Evolutionists then argue that these comparisons prove the concept that all life evolved from a hypothetical 'common ancestor' protocell that they believe lived about 3.5 billion years ago.

Called *homology* or the homology theory, since Darwin this view has been presented as a major evidence of macroevolution theory. An example of this reasoning is as follows:

'If you look at a 1953 Corvette and compare it to the latest model, only the most general resemblances are evident, but if you compare a 1953 and a 1954 Corvette, side by side, then a 1954 and a 1955 model, and so on, the descent with modification is overwhelmingly obvious. This is what paleontologists do with fossils, *and the evidence is so solid and comprehensive that it cannot be denied by reasonable people*[emphasis in original].<sup>1</sup>

Homology is not merely a minor proof of evolution, but instead has been widely cited by evolutionists as one of the *mostcompelling* lines of evidence for their theory.<sup>2,3</sup> Darwin concluded that homology was critically important evidence for common descent:

'According to Darwin's theory of common descent, the structures that we call homologies represent characteristics inherited with some modification from a corresponding feature in a common ancestor. Darwin devoted an entire book, *The Descent of Man and Selection in Relation to Sex*, largely to the idea that humans share common descent with apes and other animals ... Darwin built his case mostly on anatomical comparisons revealing homology between humans and apes. To Darwin, the close resemblances between apes and humans could be explained only by common descent.'<sup>4</sup>

Darwin reasoned that the members of the same class of animals resemble each other in the general plan of their design and, in his words, this resemblance is critical because of the fact that 'the hand of a man, formed for grasping, that of a mole

for digging, the leg of the horse, the paddle of the porpoise and the wing of the bat' are all 'constructed on the same pattern' and 'include similar bones in the same relative positions' is specifically what the theory of common descent would expect.<sup>5</sup> An early example of how homology was used to argue for macroevolution is a 1928 biology text which, in answer to the question 'Why do the individuals in a species have all of their parts homologous?', said:

'The obvious answer is, that they all *descended from the same ancestors* ... . Biologists carry this answer a step further and say that since homology within the species is the result of common ancestry therefore *all homology is due to common ancestry* and the closeness of relationship determines the number of homologous parts [emphasis in original].<sup>6</sup>

The argument from homology has been used in high school and college biology textbooks for generations. A survey by the author of 45 widely used recent college textbooks and 28 high school texts revealed that all of those that discussed evolution (except one) employed homology as a *major* proof for Darwinism. Most discussions were brief and almost identical in content and thrust. The following example was typical:

'The seven bones in the human neck correspond with the same seven, much larger, neckbones in the giraffe: they are homologues. The number of cervical vertebrae is a trait shared by creatures descended from a common ancestor. Related species share corresponding structures, though they may be modified in various ways.'<sup>7</sup>

Conklin even claims that the only *natural* explanation for homology is evolution, implying that no intelligent design explanation exists. In his words the fundamental resemblances between embryos, larvae and adults

'are just as genuine homologies as those between adult structures, and the only natural explanation that has ever been found for such homologies is inheritance from common ancestors ... . These fundamental resemblances, or *homologies*, as they are technically called, call for some explanation, and the only natural explanation that has ever been proposed is evolution.'<sup>8</sup>

A much more recent quote illustrates how this line of reasoning is still being used today to argue that the evidence of homology for the common ancestry of all life is 'very strong'.

'Why is it that bats and whales have so much in common anatomically with mice and men? Why do virtually all vertebrate forelimbs have the same basic "pentadactyl" (five fingered) design? (This is one of numerous examples of "homologous" structures exhibited by related species.)'<sup>9</sup>

The author concludes the answer is evolution. Barr lists homology as the *first* argument on his list of evidence for evolution. As the above quotes show, the same line of reasoning has been used to prove' evolution for more than a century. However, Dobzhansky admitted that 'homology does not prove evolution, in the sense that nobody has actually witnessed the gradual changes in the millions of consecutive generations which led from a common ancestor to a bird on the one hand and to man on the other'. But, he adds, homology strongly suggests evolution; 'the facts of homology make sense if they are supposed to be due to evolution of now-different organisms from a common stock. They do not make sense otherwise.'<sup>10</sup>

## Origin of the homology theory

The comparative anatomy argument called homology was probably first popularized by Huxley in 1863 to argue for human evolution. In his *Man's Place in Nature* he gathered what Milner concludes is 'overwhelming evidence' for many close homologies 'muscle for muscle and bone for bone', proving the case for homology.<sup>11</sup>

The concept of homology originally meant only that a set of structures was fundamentally similar. It was first elaborated in 1843 by one of Darwin's most informed critics, Sir Richard Owen.<sup>12,13</sup> Before Darwin, homology observations were

explained by a concept called *ideal archetypes*, meaning the Creator used the superior design prototype throughout His Creation. A branch of this worldview now is called *intelligent design theory*.<sup>14</sup> It was not until after Darwin that homology implied common ancestry. After Darwin's ideas spread, the structural similarity in many animals that had been obvious to anatomists for generations was reinterpreted as evidence for common descent.<sup>15</sup>

## An evaluation of homology as evidence for evolution

That some similarity exists when certain aspects of life forms are compared is obvious. The question is: 'Does the similarity that exists prove that one structure evolved into another and, ultimately, that the complex *evolved* from the simple?' The simplest and most obvious explanation for the fact that morphological similarities between bones, sensory organs, lungs, or gills exist among most higher animals is that the *requirements of life are similar* for similar living things, and some designs are preferred in constructing animals because these designs are superior to competing designs.

All automobile, bicycle and pushcart tyres are round because this design is superior for the function of most tyres. A tyre homology does not prove common descent, but common design by engineers throughout history because of the superiority of the round structure for rolling. Likewise, most vertebrate kidneys are similar structurally because they have a similar physiological role in the body and consequently must be similar in both structure and function.

Homology also does not prove that a set of animals is related by descent because both similarities and differences exist for any two animal types, and traits often are chosen by evolutionists only because they seem to provide evidence that two animals are related. The only criterion that was used **by Darwinists** to select examples of homology was: 'Does the example support what is assumed to be an evolutionary relationship?' Other examples are ignored or explained away. This fact is so well recognized, and so many examples exist that contradict the explanation of common descent, that evolutionists have attempted to separate most putative examples of homology into two types: **analogy** and **homology**. The division is based on a distinction between similarity due to common ancestry, or *homology*, and resemblance which is due solely to similarity of function, called *analogy*. An example is the forelimbs of humans, horses, whales and birds which are judged homologous because

'they are all constructed on the same pattern, and include similar bones in the same relative positions because these are all derived from the same ancestral bones. The wings of birds and insects, on the other hand, are analogous: they serve the same purpose, but do not constitute modified versions of a structure present in a common ancestor. The wings of birds and bats are homologous in skeletal structure because of descent from the forelimb of a common reptilian ancestor; but they are analogous in terms of their modification for flight—feathers in birds, skin membranes in bats.'<sup>16</sup>

In other words, if a design similarity supports evolutionary assumptions, it is listed as an homology and is accepted as evidence for evolution. Conversely, if a design similarity does not support evolution, it is called **analogy**, and the conclusion is drawn that the similarity exists because a certain design is highly functional for a specific body part, and not because of a common ancestor. Many analogous structures are assumed to exist due to **convergent evolution**, which is defined as the separate evolution of similar structures because of similar environmental demands.<sup>17</sup> Convergent evolution also is used to explain similar structures that have formed from different embryo structures or precursors.

Many examples of homology are actually better explained by analogy, and the resemblance that exists is often due to similarity of function and/or design constraints. The forelimbs of humans, whales and birds are similar because they serve similar functions and have similar design constraints. The conclusion that two homologous bones are similar because they are putatively 'derived from the same ancestral bones' (as Barr claims) is not based on direct evidence but instead on a *priori* conclusions demanded by macroevolution. Jones concluded that

'... the evolutionist argument from homology lacks scientific content. This particular lack has very serious implications; it strikes at the root of all attempts by evolutionists to give homology an objective basis and distinguish *homology* (similarities due to descent) from *analogy* (similarities not *due* to descent). The only way they can recognize analogous variation, especially when due to convergent evolution is by criteria (e.g. genetic or embryological) which we now know do not hold for organs of "unquestionable" homology. The evolutionist concept of homology is now shown to be entirely subjective.'<sup>18</sup>

Stephen J. Gould suggested that 'the central task of evolutionary biology is ... the separation of homologous from analogous likeness', and then emphasized that 'homology is similarity due to descent from a common ancestor, period'.<sup>19</sup> The problem with this definition is that without direct knowledge we cannot know ancestry. In answer to the question 'Can we identify fossil ancestors of species alive today?', University of Michigan Professor Mark Siddall contends that this is impossible and that the use of stratigraphic data when assembling phylogenies must be based on speculation.<sup>20</sup>

'By the late 1970s this "Idol of the Academy", what Pearson has called "ancestor hunting" but which Eldredge aptly named "ancestor worship" had been thoroughly debunked.'<sup>20</sup>

Huxley understood as far back as 1870 that when dealing with fossils, which are the only evidence we have of past life, one cannot distinguish uncles and nephews from fathers and sons.<sup>21</sup> Among the many reasons ancestors cannot be distinguished from sister taxa, as noted by Siddall and others, is that there can be no *positive* evidence of ancestry, only inferences. Lack of evidence can only allow it as a possibility or an *ad hoc* postulate.<sup>22</sup>

Although many similarities exist in almost all animal structures, structural variations are the norm. Often the variations found in the animal world seem to exist solely to produce variety, and not for the purpose of conferring a survival advantage.

Some examples in humans are as follows:

- Attached earlobes: The allele for free earlobes is dominant to the recessive *a* allele for attached earlobes.
- Tongue rolling: The *R* allele enables one to roll their tongue into a U shape and is dominant to the *r* allele (these persons lack this ability).
- Hitchhiker's thumb: People who can bend the last joint of their thumb back to an angle of 60 degrees or more have the recessive allele *h* and those who cannot have the dominant allele, *H*.
- Bent little finger: A person with the dominant allele *B* can lay their hands flat on a table and while relaxed are able to bend the last joint of the little finger toward the fourth finger. Those with the recessive allele *b* cannot do this.
- Interlacing fingers: People with the *C* allele can cross their left thumb over their right thumb when they interlace their fingers. The *C* allele is dominant over the *c* allele, which results in the person normally crossing their right thumb over their left.
- PTC tasting: Those with this the dominant allele *T* trait can detect a bitter taste in paper impregnated with phenylthiocarbamide (PTC) when they chew on it for a few seconds. Those persons with the recessive allele cannot taste this chemical.
- Widow's peak: The *W* allele (for widow's peak, a pointed hairline) is dominant to the allele which produces a straight hairline.<sup>23</sup>

To argue for macroevolution via comparisons according to 'complexity' judgments also is problematic because an enormous number of exceptions exist.

The comparative anatomy argument fails completely when an attempt is made to trace *all* living forms of life (and even fossils) back to their postulated universal common ancestor(s). Few skeleton, muscle and brain counterparts exist in single-celled animals (or in many developmental stages afterward).

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No biological or logical requirement exists to vary the design of bones, muscles and nerves needlessly in every living form beyond what is necessary to adapt the animal to its environment. Although variety is universal in the natural world, variety that interferes with the life process or an animal's survival usually is avoided in animal design. Design constraints severely limit the possible variations in an animal's anatomy, and excess deviation from the ideal can interfere with the animal's ability to survive.

The many similarities that exist among members of the animal kingdom is the result of the fact that a *single designer* created the basic kinds of living 'systems', then specially modified each type of life to enable it to survive in its unique environmental niche. Examples of major environments for which organisms must be designed include the air, ground and water. Structures that serve *similar purposes* under *similar conditions* and that are nourished by *similar foods* ought to possess similarity in both design and function. This is illustrated in a critique of Berra's Corvette analogy cited previously:

'... Berra's primary purpose is to show that living organisms are the result of naturalistic evolution rather than intelligent design. Structural similarities among automobiles, however, even similarities between older and newer models (which Berra calls "descent with modification") are due to construction according to pre-existing patterns, i.e., to design. Ironically, therefore, Berra's analogy shows that even striking similarities are not sufficient to exclude design-based explanations. In order to demonstrate naturalistic evolution, it is necessary to show that the mechanism by which organisms are constructed (unlike the mechanism by which automobiles are constructed) does not involve design.'<sup>24</sup>

## Convergent evolution

A major problem with homology theory is that many structures appear similar *superficially* yet differ significantly in such areas as anatomy, physiology, etc. Since such examples are not explained easily by homology, evolutionists have hypothesized an explanation for this problem called **convergent** evolution, which attempts to explain the analogy found.

One of the most common examples of convergent evolution is wing evolution. Wings are believed to have evolved a minimum of four times; in birds, bats (in the order chiroptera), insects and reptiles (such as the pterodactyl). Scientists have also concluded that bird wings did not evolve from fly wings for several reasons. The main one is that no evidence of insects evolving into birds (or any other animal) exists in the many insect impressions in stone, or the many examples of insects in amber, that have been discovered.

Consequently, although the evolutionary progenitors of birds are highly debated among evolutionists, insects are not considered likely candidates. The most common theory of bird evolution suggests that they evolved from dinosaurs or other reptiles. Thus, the wings of birds and insects are labeled not as homologous, but analogous, because powerful evidence refutes the idea that birds evolved directly from insects. This is one of many examples that evolutionists claim does not falsify homology theory because it was caused by convergent evolution. However, no evidence exists to support the convergent evolution theory though.

A classic example of convergent evolution is the Tasmanian Tiger (a marsupial native to Australia) and members of the dog family (which are all mammals). The two animals appear remarkably alike physically, but geographical separation and evidence from the fossil record militates against the idea that one evolved from the other or both evolved from a recent common ancestor. For this reason, it has been proposed that they evolved independently into two animals that are so close in physical appearance that a close look at the two animals is required to tell them apart! The suggestion that two animals which look remarkably alike (such as the dog and Tasmanian Tiger) evolved independently is not tenable and is a major problem for evolution.

Convergent evolution has been hypothesized to explain the numerous examples of homology in which the available evidence suggested that the animals under consideration were not closely linked by descent. An example of such gratuitous hypothesizing is the following:

'Some similarities between distant species may be caused by adaptation to similar environments, which is known as convergent evolution. Development of streamlined fins in fish (teleosts) and flippers in dolphins (mammals) are analogous: they function alike, but are very different in underlying structure. ... Linnaeus's original classification of animals does not distinguish between analogous and homologous structures. Creatures were often put in the same groups by resemblances to an imagined "divine plan" or "design". Since Darwin ... species are classified to reflect the relative closeness or distance of their common ancestry.'<sup>25</sup>

One problem with the convergent evolution hypothesis is that it requires 'reinvention of the wheel' scores or even hundreds of times. The eye is hypothesized to have evolved independently as many as 60 different times.<sup>26</sup> Given the small

probability of the evolution of a single eye or organism, the likelihood of it occurring numerous times is indefensible. Gould noted that even if evolution were repeated a thousand times, it probably would not produce the human mind again.<sup>27</sup>

## Vestigial organs and homology

Another branch of comparative anatomy studies structures in humans (and other so called 'higher' forms of life) that were believed by evolutionists to be the remains of structures that were required or useful in 'lower', less evolved and less complex ancestral forms, but that now no longer are necessary. In this case, the homologous organ in the more advanced animal is less developed, or even deemed useless. Such homologous structures or organs are referred to as *vestigial*, with most examples being assumed remnants that resulted from the loss of an earlier, better developed structure. Evolutionists used to proudly point to over a hundred such structures in humans, but the number has decreased consistently as anatomical knowledge has increased.

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Today, only a couple of examples at most are usually mentioned (and there is no doubt that even the few examples usually mentioned are useful and not vestigial). As Howitt<sup>28</sup> noted, the celebrated German anatomist, Wiedersheim, listed 180 vestigial organs in the human body, but with the increase of knowledge it has been found that every one of them has an important function, although the functions of some organs is presently viewed as minor, or as serving a back-up capacity.<sup>29,30</sup>

Moreover, if some vestigial organs can be proven to exist, they provide support not for evolution, but for *de-evolution*—i.e. evolution-in-reverse. What the evolutionists must demonstrate is that the development of *new and useful organs* is occurring today. They also must prove that a *process* exists that can form new structures called **nascent organs**, instead of trying to document that once-useful organs now are useless. Evidence for the development of new organs, or those in the process of evolving, would be evidence of evolution. As of now, no evidence of *any* nascent organ exists.

## Embryology and homology

One major problem is that in many cases organs and structures which appear identical (or very similar) in different animals do *not* develop from the same structure or group of embryo cells. It is not uncommon to find fundamental structures (e.g. the alimentary canal) that form from different embryological tissues in different animals. For example, in sharks the alimentary canal is formed from the roof of the embryonic gut cavity; in frogs it is formed from the gut roof and floor; and in birds and reptiles it is formed from the lower layer of the embryonic disc or blastoderm.<sup>31</sup>

Even the classic example of vertebrate forelimbs referred to by Darwin (and cited in hundreds of textbooks as proof for evolution) has now turned out to be flawed **as an example of homology**. The reason is that the forelimbs often develop from *different* body segments in different species in a pattern that cannot be explained by evolution. The forelimbs in the newt develop from trunk segments 2 through 5; in the lizard they develop from trunk segments 6 to 9; in humans they develop from trunk segments 13 through 18.<sup>32</sup> Denton concluded that this evidence shows the forelimbs usually are not developmentally homologous at all. As an example, he cited the development of the vertebrate kidney which provides a challenge to the assumption that homologous organs are produced from homologous embryonic tissues.

'In fish and amphibia the kidney is derived directly from an embryonic organ known as the mesonephros, while in reptiles and mammals the mesonephros degenerates towards the end of embryonic life and plays no role in the formation of the adult kidney, which is formed instead from a discrete spherical mass of mesodermal tissue, the metanephros, which develops quite independently from the mesonephros.'<sup>33</sup>

The arguments used by evolutionists have taken on new meaning in view of the past half-century of research. For example Dobzhansky argued that

'To be sure, some diehard anti-evolutionists still insist that homology means only that the Creator gratuitously chose to make homologous organs in quite unrelated organisms. This opinion may be said to be implicitly blasphemous: it actually accuses the Creator of arranging things so that they suggest evolution merely to mislead honest students of His works.'<sup>34</sup>

This research supports ReMine's biotic message theory, the conclusion that the natural world was specifically designed to look like it did *not* evolve, but was created.<sup>35</sup> ReMine uses a wide variety of examples to support his thesis which has been very favorably reviewed by the creationist community. ReMine notes that homology has been used as evidence against a designer for decades, but as this review shows, it strongly supports the biotic message theory.

## Biochemical homology

The homology argument from biochemistry parallels the argument in anatomy. Evolutionists suggest that just as the study of comparative anatomy has found evidence of anatomical homologies, likewise research on

'... the biochemistry of different organisms has revealed biochemical homologies. In fact, the biochemical similarity of living organisms is one of the most remarkable features of life ... . Cytochrome enzymes are found in almost every living organism: plant, animal and protist. The enzymes of the citric acid cycle are also almost universally distributed. Chlorophyll *a* is found in all green plants and almost all photosynthetic protists. DNA and RNA are found in every living organism and, so far as we can determine, contain the same hereditary coding mechanism. The fact that underneath the incredible diversity of living things lies a great uniformity of biochemical function is difficult to interpret in any other way but an evolutionary one. Presumably these molecules were put to their current use very early in the history of life and almost all modern forms have inherited the ability to manufacture and use them.'<sup>36</sup>

The fact that animals are 'so similar in their chemical make-up' has long been used to support Darwinism.<sup>37</sup> But extensive biochemical research has revealed that the simplest reason for biochemical homology is that all life requires similar inorganic elements, compounds and biomolecules; consequently, all life is required to use similar metabolic pathways to process these compounds. Most organisms that use oxygen and rely on the metabolism of carbohydrates, fats and proteins must use a citric acid cycle which is remarkably similar in all organisms. Furthermore, the metabolism of most proteins into energy produces ammonia, which is processed for removal in similar ways in a **wide** variety of organisms. What evolutionists must explain is why billions of years of evolution have not produced major differences in the biochemistry of life.

Many biochemical structures/systems in yeasts and other so-called 'primitive life' forms are almost identical to the biochemical families **used** in humans. With some minor variations, all life uses the same sugar and lipid family, the same 20 amino acids, about 14 vitamins and the same basic genetic code.<sup>38</sup>

Even the complex proteins used in all life are often identical or very similar. Correspondence even exists between very different forms of life such as prokaryotes and eukaryotes. Ribosomes from bacteria, even though translation signals and other differences exist, have enough similarity that they can be made to 'translate human messenger RNAs into human proteins—and *vice versa*'.<sup>39</sup> The problem for evolutionists is that the biochemistry of all life, even that allegedly separated by hundreds of millions of years of geologic time and evolution, *is too similar*. Despite the many significant differences between the two basic cell forms (eukaryotes and prokaryotes), they are both

'... remarkably similar on the biochemical level ... . Prokaryotes and eukaryotes are composed of similar chemical constituents. With a few exceptions, the genetic code is the same in both, as is the way in which the genetic information in DNA is expressed. The principles underlying metabolic processes and most of the more important metabolic pathways are identical. Thus, beneath the profound structural and functional differences between prokaryotes and eukaryotes, there is an even more fundamental unity: a molecular unity that is basic to life processes.'<sup>40</sup>

Although many biochemical similarities exist in life, millions of biochemical differences exist that are inexplicable via evolution. Many of these differences do not provide a *selective advantage* as implied by the claim that Darwinistic mechanisms have fine tuned life for the past 3.6 billion years. Creationists suggest that such differences exist due to the need for ecological balance and because the Creator chose to employ variety. Also, were one compound in an organism to be altered, scores of other compounds with which it interacts would **often** also need to be changed so that the entire biological system could function as a harmonious unit.

## Genetics and homology

According to the evolutionary theory, homologous features are programmed by similar genes. Gene sequence similarity would indicate common ancestry since such similarities are unlikely to originate independently through random mutations. If the bones of the human arm evolved from the same precursors as the wing of a bat and the hoof of a horse as evolution teaches, then we should be able to trace these alleged homologies to the DNA that codes for them. Some geneticists thought this knowledge would allow them to find the chemical formula needed to produce an arm, leg, or other structure. But once biologists acquired a greater understanding of genetics, they found that what are labeled as homologous structures in different species often are produced by quite different genes.

Homology predicted that features produced by similar genetic sequences are phylogenetically homologous. There are now so many exceptions to this prediction that the concept of genetic homology cannot now be said to be a rule, but the exception. The classic example is mutations in certain homeotic genes<sup>41</sup> which can cause wholesale changes in morphology such as producing two pairs of wings instead of the normal single pair, or replacing a fly's antenna with a leg (or can even cause eyes to develop on the fly's leg). Genes that produce results similar to the homeotic genes for flies' wings have been found in *most* other animal kinds, including mammals and humans.<sup>42</sup>

In another example, the gene that controls mouse eye colour also happens to control the mouse's physical size; but the gene that controls the fruit fly's eye colour controls not the fruit fly's size, but female sex organ morphology.<sup>43</sup> Although mice and flies share a similar gene (called *eyeless*) which functions to control their eye development, the fly's multifaceted eye is profoundly different from a mouse's mammal eye. In both the fly *Antennapedia* and mouse *eyeless*, similar homeotic genes control development of structures which are *not* homologous by either the post-Darwinian phylogenetic or the classical morphological definition.<sup>44</sup>

The finding that similar genes regulate such radically different structures strongly argues against the concept of homology. So many genes used in higher organisms have multiple effects that Ernst Mayr once suggested that genes which control only a single characteristic are rare or nonexistent. The finding that a consistent one-gene/one-characteristic correspondence does not exist has been a major set back to the Darwinian interpretation of homology. Because evolutionary biologists have failed to provide a biological basis for their homology research findings, Roth concluded 'that the title of de Beer's 1971 essay—*Homology, an unsolved problem*—remains an accurate description ... . The relationships between processes at genetic, developmental, gross phenotypic and evolutionary levels remain a black box'.<sup>45</sup> Research at the molecular level has failed to demonstrate the expected correspondence between gene product changes and the organismal changes predicted by evolution.<sup>24</sup>

Evolution by DNA mutations 'is largely uncoupled from morphological evolution'.<sup>46</sup> An example of this is the large morphological dissimilarity that exists between humans and chimpanzees despite a high similarity in their DNA.<sup>46</sup> In short we now know:

'... in general the homology of structures such as organs or modules cannot be ascribed to inheritance of homologous genes or sets of genes. Consequently, organ homology cannot be reduced to gene homology. Van Valen recognizes this too and therefore suggests, as an alternative, to reduce homology to a continuity of [developmental] information. Information is not the same as genotypic nucleic acid. But what it is exactly, and how it is continuous, is still an unsolved problem.'<sup>47</sup>

## Conclusion

As scientists learnt more about anatomy, physiology and especially genetics, the concept of homology increasingly came under attack. One problem however, was that examples which seemed to fit evolutionary assumptions were often cited, while the **many** examples that do not fit were ignored. And, in time, more and more examples were discovered that had to be ignored. Eventually, as one observer noted, homology led Darwinists to assemble **very select** examples that seemed to prove ancestor-descendant relationships that often were quite convincing. In addition, as Milton has observed,

'It is homology that Darwinists rely on to bridge the gaps in the fossil record. ... It is homology that underlies the diagrams drawn up by Darwinists from Haeckel to the present day showing how every living thing is related. Ultimately, however, it is homology that has provided the greatest stumbling block to Darwinian theory, for at the final and most crucial hurdle, homology has fallen.'<sup>48</sup>

The recent information explosion in embryology, microbiology, genetics and especially molecular biology has revealed in minute detail how plants and animals are constructed at the molecular level. If the Darwinian interpretation of homology were correct, then we would expect that the same homologies found at the macroscopic level also exist at the microscopic, biochemical and genetic levels. What researchers in each of these fields often find, has greatly undermined the homology concept. So many exceptions now exist that molecular biologist Michael Denton concluded that the homology theory should be rejected. His main argument is that genetic research has not shown that homologous structures are produced by homologous genes and follow homologous patterns of embryological development. Instead, genetics has found that homologous structures are 'often specified by non-homologous genetic systems' and furthermore, the homology 'can seldom be extended back into embryology'.<sup>49</sup>

Why do most scientists accept macroevolution theory? A major reason is that it is now the accepted world view of scientists—an idea to which they are exposed from the earliest days of training, and by which they are surrounded daily. Most scientists are influenced by social pressure, and many believers fear recriminations from their fellow scientists if they do not conform to what currently is viewed as correct. To prove their orthodoxy, many scientists have become unscientific and have embraced the religion of 20<sup>th</sup> century-naturalism.<sup>50</sup> Belief in evolutionism

requires a credulity induced partly by pressure to conform to a world of science that is saturated with naturalism.

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