

A CRITIQUE OF "29 EVIDENCES FOR MACROEVOLUTION" PART 3

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PREDICTION 11: ANATOMICAL PARALOGY

One major consequence of evolutionary opportunism is the predicted existence of paralogy. Paralogy, as I use the term here, is similarity of structure despite difference in function. When one species branches into two species, one or both of the species may acquire new functions. Since the new species must recruit and modify preexisting structures to perform these new functions, the same structure shared by these two species will now perform a different function in each of the two species. This is paralogy. It follows that paralogous structures have a history that should be explicable from other lines of evolutionary evidence, since derived characteristics (which is what these new functions and structures now are) have evolved from more primitive (i.e. older) structures. Consequently, detailed and explicit predictions can be made about the possible morphologies of fossil intermediates.

An equivalent way of stating the principle of evolutionary paralogy is that the predicted phylogenetic tree must have structural continuity, as opposed to functional continuity. Structures and patterns are inherited, but not necessarily functions. As one follows the line from ancestor through descendants, the functions and forms can come and go, but the underlying structures must grade from one into another, relatively unchanged.

The alleged prediction and fulfillment are:

1. If universal common ancestry is true, then some species will have structures that are similar to structures in other species but which perform different functions in the other species.
2. Some species have structures that are similar to structures in other species but which perform different functions in the other species.

"Paralogous structures"²³ are not a necessary result of all possible mechanisms of universal common descent. They are understandable within a neo-Darwinian framework

²³ "Paralogy" is commonly used in the context of molecular biology to refer to the presence of gene copies within the same organism. Dr. Theobald defines "paralogy" as "[s]imilarity of structure despite difference of function; the opposite of *convergence*." He defines "convergence" as "[t]he case of similar function despite different structures; the opposite of *paralogy*." In conventional parlance, "Characters that are *similar in structure and function* but have arisen separately rather than from a common ancestor are termed convergent" (emphasis supplied). (Carroll, 7.) They are presumed to have become similar structurally through the pressure to perform similar functions (e.g., the forelimbs of sharks, penguins, and porpoises). Parallelism (or parallel evolution), which is apparently not what Dr. Theobald means by paralogy, has been distinguished from convergence as follows: "Convergence is the development of similar characters separately in two or more lineages without a common ancestry pertinent to that similarity. Parallelism is

of random mutation and natural selection, but since Dr. Theobald has chosen to argue for common ancestry without regard to any mechanism of descent, he cannot offer as evidence data that can be explained only by particular mechanisms of descent.

Moreover, even neo-Darwinism does not demand paralogous structures; it simply accommodates them. Putting aside the ambiguity of "similar," which can span even the gulf between reptilian and avian respiration systems, if hands, wings, flippers, and legs (to cite Dr. Theobald's examples) did *not* share a "similar" pattern of construction, it simply would produce a different evolution story. Various reasons would be offered as to why the basic limb structure was not conserved in these lineages. I can imagine the structural differences being touted as proof of the blindness of the evolutionary process. What I cannot imagine is this lack of conservation causing evolutionists to lose any sleep.

One cannot take a known pattern of life, claim that pattern as a *prediction* of evolution, and then use the fact the pattern fits the prediction as evidence for the truth of evolution. To be of evidentiary value, the predictions must derive from the hypothesis itself, not be read back into the hypothesis from present knowledge. This is an especially daunting task for Dr. Theobald, since he disavows reliance on any particular mechanism of descent.

Even if one granted that "paralogous structures" indicate a common ancestry for those possessing them, they say nothing about the origin of that common ancestor, whether it descended from a universal common ancestor, descended from one of many independently created organisms, or was itself created independently. Therefore, the argument does not advance the proposition of universal common ancestry. It is like arguing that everyone at a party in Los Angeles came from New York by showing that groups of them arrived from various cities between the two.

In any event, common ancestry certainly is not the only explanation available for "paralogous structures." As biologists Percival Davis and Dean Kenyon explain:

[T]he existence of homologous structures²⁴ merely raises questions of relationship, but it cannot answer them. This is why Stephen Gould remarked that homology supports common design as well as it does common ancestry. [S. J. Gould, *Natural History*, January 1987, 14.] Both Darwinists and design proponents can explain the existence of homologies within their respective frameworks of interpretation. Because of this,

the development of similar characters separately in two or more lineages of common ancestry on the basis of, or channeled by, characteristics of that ancestry." (Carroll, 7.) A standard example of parallel evolution is the wing patterns of moths and butterflies. Some question whether parallel evolution is a genuine phenomenon, claiming that all evolution is ultimately convergent or divergent (adaptive radiation).

²⁴ Homologous structures are parts of different organisms that are similar in structure and are assumed to have arisen by common descent. They may serve the same or different functions in the organisms. Dr. Theobald's "paralogous structures" are thus a specific case of homology (in that he includes only those structures that serve a different function).

neither side can disprove the other's interpretation of homology, and neither view stands solely on its own interpretation of homology. (Davis and Kenyon, 133.)

The standard creationist understanding of the phenomenon is summarized by Brand:

How did the limb bones of those four mammals (the human, seal, bat, and dog in Fig. 9.7) develop the way they did? An engineer devising different kinds of machines wouldn't start from scratch for every machine. The data indicate that if an intelligent Creator designed the limb system for vertebrates, He developed a flexible general plan which could be adapted for the lifestyle of each animal. The result is a series of homologies from the work of a common Designer who created all of these animals in an organized fashion. (Brand, 156-157.)

It is interesting that the forelimbs and hindlimbs of a terrestrial vertebrate are strikingly similar in design,²⁵ but no evolutionist attributes that similarity to common descent. Rather, they believe the two patterns arose independently from the pectoral and pelvic fins of a fish. The creationist links the similar limb designs through a common Creator, whereas the evolutionist is left to appeal to chance and unspecified selective pressures.

The suggestion that a Creator would not use similar designs for different functions is blatantly theological. Those who do not share that opinion will be unimpressed by evidence that draws its weight from it. To repeat a previous quote:

Behind this argument about why the patterns in biology prove evolution lurks an enormous metaphysical presupposition about God and creation. If God made the species, then they must fulfill our expectations of uniqueness and good engineering design. We might say that God was supposed to have optimized the design of each species. Evolutionists have no scientific justification for these expectations, for they did not come from science. They are part of a personal religious belief and as such are not amenable to scientific debate. In fact, evolutionists rely on a rather narrow metaphysical target for their attacks on creation. The evolutionist's notion of God and divine creation is, for many people, just a straw man -- an overly simplified metaphysic that conveniently supports their views. (Hunter, 49.)

²⁵ "The proximal part of both the fore- and hindlimb is composed of one main bone, humerus in the arm, femur in the leg. The next section of the limbs is composed of two bones, radius and ulna in the arm, tibia and fibula in the leg." (Denton 1986, 152.) The next section has a cluster of small bones, carpals in the arm, tarsals in the leg. This section is followed by metacarpals and phalanges in the arm, which correspond to metatarsals and phalanges in the leg.

In fact, ReMine argues that use of similar designs for different functions is actually evidence for creation in that it is an essential part of the Creator's biotic message. He believes life was designed both for survival and for communicating a message about where life came from. The content of that biotic message is that living objects were constructed by a single source and that they did not result from naturalistic processes. Nested hierarchy is an important part of the message for a number of reasons (see, ReMine, 368 and 465 for a summary),²⁶ and that makes it necessary for similar designs sometimes to be used for different functions.

The answer [to why a designer would sometimes use the same design to accomplish a different purpose] is simple. The designer must use the same design to accomplish different purposes because the nested pattern requires it. The nested pattern places demands on the occasions when a biomessage sender must use shared design, and when shared design is prohibited. Therefore, on occasion the designer is forced to use the same design for different purposes. (ReMine, 364.)

Regardless of whether one accepts ReMine's thesis, it offers a glimpse into the potential complexity of creative purposes. It is a weak argument indeed that assumes complete comprehension of those purposes.

The claim that "[t]he fossil record shows a chronological progression of intermediate forms between theropod dinosaurs and modern birds, in which theropod structures were modified into modern bird structures" is incorrect. No dinosaur with particularly avian affinities is known before the Late Jurassic, making them contemporaries of *Archaeopteryx*, and those with the most birdlike characteristics do not occur until much later.²⁷

The suggestion that the hypothesis of universal common ancestry would be falsified if the fossil record showed "a chronological progression in which bird wings are gradually transformed into reptilian arms" is incorrect. If evolution can make a reptile into bird, there is no reason it cannot modify wings into reptilian arms. In fact, some experts have actually suggested that coelurosaurs were derived from primitive birds. (Fallow, 108-110; Feduccia, 90.)

²⁶ Prior to ReMine, Denton emphasized that nested hierarchy "implies the absence of any sort of natural sequential relationship among the objects grouped by the scheme." (Denton 1986, 121.) Instead, it "implies artificial logical relationships of a non-sequential sisterly kind." (Denton, 1986, 122.) Like ReMine, he recognized that "direct evidence for evolution only resides in the existence of unambiguous sequential arrangements," whereas "these are never present in ordered hierarchic schemes." (Denton 1986, 131.)

²⁷ The earliest known coelurosaurs, *Compsognathus*, *Coelurus*, and *Ornitholestes*, are all from the Late Jurassic. The earliest known dromaeosaurids, *Sinornithosaurus* and an unidentified species, are from the middle Early Cretaceous, some 25 million years later. (Xing and others; Qiang and others.) *Deinonychus*, the next oldest dromaeosaurid, is from the late Early Cretaceous. With the exception of the two Yixian specimens, the most birdlike dromaeosaurids are from the Late Cretaceous, some 75 million years after *Deinonychus*. (Feduccia, 90; Padian and Chiappe, 78; Hutchinson and Padian, 132; M. J. Benton, 699, 702.)

Neither would the hypothesis of universal common ancestry be falsified if it were demonstrated that the "primitive structures of an organism's predicted ancestors could not be reasonably modified into the modern organism's derived structures." That is precisely what happened in the case of *Coelurosauravus*, and yet evolutionists did not view it as a threat to their theory.²⁸ Evolution can accept the development of novel structures and does so whenever necessary to accommodate the data.

Contrary to Dr. Theobald's assertion, it is not a prediction of universal common ancestry (or neo-Darwinism) "that we should never find birds with both wings and arms, or mollusks harboring chloroplasts." If those things were found, they would be explained within the evolutionary framework. As ReMine says, "The frustrating thing about natural selection is that its theorists can refuse to be ingenious at the necessary places. They take a structure *known not* to exist, then they say that natural selection predicts it *could not* exist. This sudden lack of imagination is too convenient." (ReMine, 149.)

PREDICTION 12: MOLECULAR PARALOGY

The concept of paralogy applies equally to both the macroscopic structures of organisms and structures on the molecular level.

Presumably, the alleged prediction and fulfillment are:

1. If universal common ancestry is true, then some species will have biological molecules that are similar in structure to biological molecules in other species but which perform different functions in the other species.
2. Some species have biological molecules that are similar in structure to biological molecules in other species but which perform different functions in the other species.

Since this is the concept of "paralogous structures" applied to biological molecules, much of the preceding response is applicable. Paralogous biological molecules are not a necessary result of all possible mechanisms of universal common descent. They are understandable within a neo-Darwinian framework of random mutation and natural selection, but since Dr. Theobald has chosen to argue for common ancestry without regard to any mechanism of descent, he cannot offer as evidence data that can be explained only by particular mechanisms of descent.

²⁸ Prior to 1997, it was believed that coelurosauravids had greatly elongated ribs that were connected to tissue to form a gliding surface comparable to that of the living lizard *Draco*. (Carroll, 220.) It was discovered, however, that the hollow, rodlike wing bones of *Coelurosauravus* were not extensions of the ribs. In fact, they were not attached to any part of the skeleton! Rather, they formed in the skin, making them completely unlike the bones of any other tetrapod. (Frey and others.) The pteroid bone of pterosaurs and the carapace of turtles are other examples of novel structures in vertebrates.

Moreover, even neo-Darwinism does not demand paralogous biological molecules; it simply accommodates them. To use Dr. Theobald's example, if lysozyme and alpha-lactalbumin were *not* "similar," it simply would be assumed that alpha-lactalbumin arose by some other evolutionary path. Indeed, lactalbumin was long considered to have arisen de novo in the ancestor of mammals, and this caused no consternation in evolutionist ranks. If the similarities between lysozyme and lactalbumin had not been discovered, the old script would have continued in service of the evolution paradigm.

In any event, universal common ancestry is not the only explanation available for paralogous biological molecules. On what basis does one assert that a Creator would not use similar amino acid sequences and similar folds in the design of two separate proteins? Even if it was possible biochemically to design a protein that had all the functions of lactalbumin but was unlike lactalbumin in structure, a Creator could still opt to work from a lysozyme-like template. If, on the other hand, the structure of lactalbumin is dictated largely by its function, it could not be created without similarity to lysozyme. Either way, there is no basis for insisting that the similarity of these proteins is the result of common descent.

The example of the genetic comparisons between the baker's yeast (*Saccharomyces cerevisiae*) and the worm (*Caenorhabditis elegans*) is much the same. The opinion that the genes unique to *C. elegans* were derived from genes it shared with *S. cerevisiae* is driven by a commitment to evolution and a theological assumption. As Hunter said of a similar argument, "Ultimately it comes down to [the] belief that a Creator would not have created species with commonality -- at bottom it is a religious argument." (Hunter, 100.)

The suggestion that universal common ancestry would be falsified if proteins performing more recently evolved functions did not "have homologues with proteins performing core functions" is incorrect. As already mentioned, lactalbumin was long considered to have arisen de novo in the ancestor of mammals, and evolutionists were unfazed. As with anatomical structures, evolution can accommodate both the presence and the absence of novel proteins.

The suggestion that universal common ancestry would be falsified "if we had found that genes involved in multicellular functions . . . were *more ancient* than the core function genes" (emphasis supplied) is trivial. By "core function genes" Dr. Theobald means "genes dealing directly with core biochemical functions *that all organisms must perform*" (emphasis supplied). If these genes are essential for life, then obviously no genes can predate them, as genes exist only in living things.

The suggestion that universal common ancestry would be falsified "if we had found that genes involved in multicellular functions were more deeply rooted in their phylogenies" is incorrect. It is already believed that some genes are rooted in an

organism's phylogeny more deeply than is the feature the gene is believed to control,²⁹ and yet evolutionists remain committed to their theory.

PREDICTION 13: ANATOMICAL CONVERGENCE

A corollary of the principle of evolutionary opportunism is convergence. Convergence is the case where different structures perform the same or similar functions in different species. Two distinct species have different histories and different structures; if both species evolve the same new function, they may recruit different structures to perform this new function. Convergence also must conform to the principle of structural continuity; convergence must be explained in terms of the structures of predicted ancestors.

The alleged prediction and fulfillment are:

1. If universal common ancestry is true, then some species will have structures that perform the same or a similar function performed by different structures in other species.
2. Some species have structures that perform the same or a similar function performed by different structures in other species.

It is not a prediction of the hypothesis of universal common ancestry or the more specific hypothesis of neo-Darwinism that different species will have different structures that perform the same function.³⁰ As ReMine observes, "Evolutionary theory does not predict any adaptations, much less convergent adaptations." (ReMine, 141.) This is but another example of taking a known pattern of life, claiming that pattern as a *prediction* of evolution, and then using the fact the pattern fits the prediction as evidence for the truth of evolution. "Evolutionists merely *claim* that extensive convergence is virtually inevitable. They do this because 'convergence' is abundant in nature." (ReMine, 168.)

Moreover, "convergence" by definition involves two separate starting points ("distinct species") that "converge" on a given structure and/or function. It says nothing about how those starting points came to be separate. So whatever else one may make of the phenomenon, convergence is not evidence for universal common ancestry, the proposition being argued by Dr. Theobald.

The plasticity of evolutionary theory with regard to convergence is laid bare by ReMine:

²⁹ The homeotic gene *Pax-6* is believed to be a master control gene for eye morphogenesis and to be universal among multicellular animals. The universality of the gene is thought to be the result of its presence in a common ancestor, yet this common ancestor is not thought to have had eyes. Evolutionists assume that this gene evolved by encoding primitive adaptations that remain to be discovered. (Wells 1998, 56-58.)

³⁰ What are believed to be convergently evolved features are often very similar in structure, but since they are not identical, they warrant the label "different." For example, squid eyes are so similar to human eyes that they are often dissected in biology classes to help students understand human eyes (Wise, 212), but they are not identical.

Again, there is a difference between what evolutionary theory says (which is nothing coherent), and what evolutionists claim the theory says (which they conveniently choose to match the data). Evolutionary theory is flexible to whatever problem is at hand.

Here is an example.

Thus we should expect to see *many* different genetic solutions to *any* adaptive problem. (Futuyma, 1983, p. 126, my italics)

Indeed *many* of the environmental problems have *only a limited number* of genetic solutions . . . (Newell, 1982, p. 193, my italics)

Futuyma is explaining the plentiful existence of adaptive *variation* (called diversity). Newell is explaining the plentiful existence of adaptive *similarity* (called convergence). Therefore, they selected different explanations from the evolutionary smorgasbord. The two explanations happen to contradict each other.

The major "adaptation" in evolution is the way evolutionists adapt their theory to fit the data. Evolutionary theory can be easily adapted because it is untestable; its bonds are few, its flexibility is great. It is bent and molded by the needs of evolutionary storytelling. (ReMine, 142.)

In fact, convergence poses quite a challenge to neo-Darwinism, which is why "evolutionists avoid the convergence explanation when they can." (ReMine, 269.) As Wise explains:

[A]nalogies³¹ are being found to be a very common feature of life. Every tree that takes into account at least a couple dozen features and includes several major groups of organisms seems to encounter several noninherited similarities.

Considering the fact that organisms are composed of millions or even billions of features, the true number of analogies is likely to be extremely high. Yet this does not seem to be consistent with evolutionary theory. In an evolutionary scenario, analogies are features formed independently in two different organismal groups. The pathway that evolution takes is thought to be fraught with unpredictable events that the likelihood that two separate evolutionary pathways will end up at the same place is thought to be very low. This is the major theme of Stephen Jay Gould's book *Wonderful Life*. If the evolutionary process were run over

³¹ "Analogies" are similar features believed to have evolved convergently (i.e., independently).

again, one would not expect to get the same organisms again. Only when a feature is extremely advantageous to the organism *and* easy to produce naturalistically can it be considered reasonable that it could have evolved more than once. Most features, however, are so very complex that it is not clear that any of them could be so easily produced as to make even one a probable event. In evolutionary theory analogies would be expected to be a very uncommon feature of life. (Wise, 213.)

Biophysicist Lee Spetner has attempted to quantify the magnitude of the challenge convergence poses to evolutionary theory. In a nutshell, he claims that, if evolutionists ascribe a positive selective value to enough potential mutations to make speciation conceivable, then it becomes essentially impossible for similar traits to arise independently (because the number of potential pathways is too great). (Spetner, 85-124.) In his words, "if the variation arises from random copying errors, convergent evolution is impossible." (Spetner, 110.) A summary of Spetner's argument is available at http://www.creationresearch.org/creation_matters/97/cm9707.html#Not by Chance.

[T]he explanations [of convergence offered by evolutionists] go no further than sweeping generalities about how evolution "in due course selects the most efficient design for the animal's or plant's lifestyle in the particular set of the environmental circumstances." In fact, evolutionists seem to be quite content with this explanation. As Berra concludes: "Such close similarities in very unrelated groups are easily explained as a result of convergent evolution." Perhaps too easily. Though evolution is a blind process that produces a broad menagerie of species and designs, it is also supposed to produce striking similarities. (Hunter, 31.)

On the other hand, if "the diversity of life is due to an Intelligent Designer's creating a number of distinct organisms, analogies should be common, as is observed, and as will be more commonly recognized with time." (Wise, 213.) Brand puts it this way:

Different kinds of wings are analogous because the Designer gave different kinds of organisms some of the same abilities. He made insects with a body plan different from mammals and birds, but some representatives of each group were made to fly. Because of their different underlying structural organization, their flight mechanisms are analogous, not homologous. (Brand, 156.)

ReMine argues that convergences are a crucial aspect of the Creator's biotic message. They serve the goals of that message in that they unify life, thwart phylogeny, and resist naturalistic explanation. (ReMine, 261-262, 264, 351, 354, 367.) He writes:

To successfully send the biotic message, a designer must not indiscriminately use the same design repeatedly. Therefore, the designer

is forced to sometimes use *different* designs to perform the same function. The wings of bats, birds, and pterodactyls make a classic example. . . .

The bat's wing is made by lengthening four fingers, while the pterodactyl's wing is made by lengthening only one finger (what would be our little finger), and the bird's wing is made by diminishing the hand and providing it with feathers. Evolutionists claim these are evidences of evolution. They claim that a capable designer would not experiment with different designs.

The evolutionists are mistaken. A biomessage sender has every reason to design this way:

- The similarity of these three organisms cannot be denied. They are variations on a theme, and possess a common body plan. This sends the unifying message.
- These organisms are systematically placed (regarding all other organisms) so their common possession of wings cannot be explained by common descent. This sends the non-naturalistic message.
- The wing designs are sufficiently different that they cannot be explained by transposition. This sends the non-naturalistic message. This is precisely their difficulty for evolution. If the wings were identical, then there would be no trouble rationalizing them by transposition.

The biomessage sender made these organisms difficult for evolutionists to explain. Evolutionists are left to account for the evolution of wings (and *flight!*) separately for each case. Rather than being evidence for evolution, these organisms are clean evidence for message theory. (ReMine, 354.)

The suggestion that universal common ancestry would be falsified by the discovery of a "close mammalian relative" that possessed gills is incorrect. It would be explained within the evolutionary framework, either by assuming the creature was related to mammals more distantly or by appealing to the amazing transforming powers of natural selection. To repeat ReMine's comment, "The frustrating thing about natural selection is that its theorists can refuse to be ingenious at the necessary places. They take a structure *known not* to exist, then they say that natural selection predicts it *could not* exist. This sudden lack of imagination is too convenient." (ReMine, 149.)

PREDICTION 14: MOLECULAR CONVERGENCE

Like paralogy, convergence should be represented on both macroscopic and molecular levels.

Presumably, the alleged prediction and fulfillment are:

1. If universal common ancestry is true, then some species will have biological molecules that perform the same function performed by different biological molecules in other species.
2. Some species have biological molecules that perform the same function performed by different biological molecules in other species.

This is the concept of anatomical convergence applied to biological molecules, so much of the preceding response is applicable. Again, it is not a prediction of the hypothesis of universal common ancestry or the more specific hypothesis of neo-Darwinism that different species will have different biological molecules that perform the same function. To paraphrase ReMine, evolutionary theory does not predict any particular biological molecules, let alone convergent biological molecules. Since the theory does not predict the phenomenon, it cannot be falsified by its absence or confirmed by its presence.

As already noted, "convergence" by definition involves two separate starting points (distinct molecules) that "converge" on a given structure and/or function. It says nothing about how those starting points came to be separate, whether by separate creation or common descent. Therefore, it is not evidence for universal common ancestry, the proposition being argued by Dr. Theobald.

This is another attempt to make the hypothesis of common ancestry more attractive by arguing against the alternative of divine creation (rather than arguing *for* common ancestry). Such negative theology is especially ill suited for Dr. Theobald's case because, as pointed out in the introduction, divine creation (via common descent) is compatible with the "amechanistic" theory of common ancestry he is asserting. Furthermore, divine creation is not the only theoretical alternative to universal common ancestry, so eliminating it as a possibility would not establish the truth of universal common ancestry.

More importantly, however, the argument is based on the unprovable theological premise that a Creator would not use different structures to accomplish similar functions in different species. If two or more robots at a science fair solved a sophisticated problem in different ways, it would be considered a tribute to human ingenuity. If it were revealed that the same person had designed all the robots, he or she would be considered a creative genius. Perhaps multiple solutions to some biological functions are an analogous display of creativity.

The retort that an intention to display creativity in biology is contradicted by the fact organisms often exhibit similarity assumes that a Creator cannot have a reason for employing both diversity and similarity selectively. This too is a theological claim, not a scientific one. Those who believe that God may have reasons for things that are beyond

our searching out will rightfully discount evidence that draws its weight from a rejection of that belief.

ReMine's biotic message theory provides one possible purpose for a Creator to employ diversity and similarity selectively. He writes:

These problems [of untestability and seemingly contradictory intentions] are resolved by message theory, which identifies a specific self-consistent goal the designer had in mind. The designer created life as a biotic message: to look like the product of a single designer and unlike all other interpretations. Similarity and diversity both have a role in the biotic message. Similarity makes life look like the work of one designer, while diversity makes life difficult to explain by naturalistic processes. Similarity and diversity are the alphabet for the biotic message. (ReMine, 37.)

It is also quite possible that different biological molecules that perform the same function in different species are also performing other functions of which we are not aware. In that case, the differences in structure could be explainable on functional grounds. The assumption that we have complete knowledge of how convergent molecules function within an organism is unwarranted.

PREDICTION 15: SUBOPTIMAL ANATOMICAL FUNCTION

Another consequence of evolutionary opportunism is the existence of apparent suboptimal function. As stated before, in evolving a new function, organisms must make do with what they already have. Thus, functions are likely to be performed by structures that would be arranged differently (e.g. more efficiently) if the final function were known from the outset. "Suboptimal function" does not mean that a structure functions poorly. It simply means that a structure with a more efficient design (usually with less superfluous complexity), could perform the same final function equally as well. Structures with suboptimal function should have a gradualistic historical evolutionary explanation, based on the opportunistic recruitment of ancestral structures, if this history is known from other evidence (e.g. if this history is phylogenetically determined by closely related organisms or fossil history).

The alleged prediction and fulfillment are:

1. If universal common ancestry is true, then some organisms will have structures that are not designed most efficiently for the function they perform.
2. Some organisms have structures that are not designed most efficiently for the function they perform.

It is not a prediction of the hypothesis of universal common ancestry or the more specific hypothesis of neo-Darwinism that organisms will have structures that are not

designed most efficiently for the function they perform. Evolution can accommodate suboptimal design, but it can also accommodate its absence. As ReMine says:

[T]he argument from imperfection is not evidence for evolution. Neither perfection nor imperfection is evidence for evolution, since evolution is so vacuous it could accommodate both situations. Perfection is not immune from the facile just-so stories of natural selection, even Gould admits this.

But perfection could be imposed by a wise creator or *evolved by natural selection*. (Gould, 1984a, p 122 my italics) (ReMine, 26.)

Even neo-Darwinism does not maintain that "in evolving a new function, organisms *must* make do with what they already have" (emphasis supplied). (This error is repeated under "Potential Falsification," where Dr. Theobald writes, "The *only* 'fixing' that is allowed evolutionarily is relatively minor modification of what already exists" [emphasis supplied].) I have already shown that neo-Darwinism is flexible on that proposition. The development of novel structures is accepted whenever necessary to fit the data within the evolution paradigm (see the examples in the discussion of Prediction 11).

Once again, this is an attempt to make the hypothesis of common ancestry more attractive by arguing against the alternative of divine creation (rather than arguing *for* common ancestry). "The argument from imperfection never was evidence for evolution, instead it was used as evidence *against* a designer." (ReMine, 26.) As noted above, such negative theology is especially inappropriate in Dr. Theobald's case (because an "amechanistic" theory of common ancestry is compatible with divine design). Furthermore, divine creation is not the only theoretical alternative to universal common ancestry, so eliminating it as a possibility would not establish the truth of universal common ancestry.

The argument against divine creation is: (a) God would never create a structure that was not designed most efficiently for the performance of its task; (b) some structures in organisms are not designed most efficiently for the performance of their task; (c) therefore, God did not create those structures (and hence did not create those organisms). There are several difficulties with this argument.

First, it is an unprovable theological premise that God would never create a structure that was not designed most efficiently for the performance of its task. Brand remarks:

The use of the Panda's thumb [a frequently-cited example of imperfect design] as a scientific argument against interventionism is valid only if we have objective data to support the hypothesis that a Creator would not use such a design; otherwise, it is only a philosophical argument. The data show us that if there is a Creator, He used a

hierarchical design for life. How can we be sure that He would not use the genetic patterns of other bears to fashion a thumb for the panda, rather than interjecting a feature from some other animal into the bear's already cohesive genetic system? (Brand, 166.)

ReMine argues that the placement of such odd arrangements and funny solutions within living creatures was done deliberately by a Creator to send a message. As he explains:

Evolutionists have seen "odd arrangements and funny solutions" in nature and they insist these are paths a sensible designer would never tread. They are mistaken. Not only is it sensible, but message theory *absolutely requires it*, though at first it will seem paradoxical.

We expect a designer of life to create perfect designs. Yet this expectation itself constrains a biomessage sender to do the unexpected. A world full of perfect optimal designs would form an ambiguous message. In fact, it would not look like a message at all. It would provide no clues of an intentional message. It would look precisely as expected from a designer having no such intentions. Life's designer created life to look like a message, and therefore had to accept an astonishing design constraint: life *must* incorporate odd designs. . . .

It is not enough for a biomessage sender to merely include odd designs. All the designs together must form a pattern attributable only to a single designer. Life on earth has such a pattern.

Suppose we examined many separate handwritten documents. How would we recognize they all had the same author? Answer: By the overall pattern, especially the funny quirks and odd imperfections. It is the same thing with living organisms.

The quirks and imperfections play a key role in the pattern. They unite all organisms into a unified whole, while looking unlike the product of multiple designers. They give life the distinctive look of a single designer. They also make the pattern look like an intentional message, rather than an ordinary design effort. . . .

The concept of "perfection" is loaded with different meanings. Anti-creationists thought of it solely as engineering elegance. Yet message theory indicates a slightly different standard is needed. Biological designs serve a dual role: (1) as instruments of survival; and (2) as conveyors of a message. There is some range between 'elegant engineering designs' and 'designs sufficient for survival.' Life's designer used this range to incorporate a message. In this sense, life's designs are neither imperfect nor non-optimal. They are more aptly described as odd

and curious. The argument from imperfection falls down because it used the wrong concept of perfection. (ReMine, 27-28.)

God also may have allowed an originally perfect creation to degenerate as a result of human rebellion. In that context, organisms may have evolved adaptations (within their created kind) that were less than optimally efficient. Also, optimally efficient original designs may have become flawed by the introduction of unreliability into the performance of system components. For example, the intersecting of the trachea and esophagus is problematical only if the epiglottis fails to close during swallowing. If that would not occur in a pre-Fall world, the original design could not even be accused of being suboptimal.

Other divine considerations, such as beauty or whimsy, may have guided some design choices. If, for example, the trachea were connected directly to the nostrils, what additional organs would be required for speech? The teeth and tongue could not simply be relocated, as they are used in chewing. And how large would the nasal passage need to be to accommodate highly aerobic activity (the kind that now causes us to breathe through our mouths)? We are in no position to judge the aesthetic price of such changes in the eyes of a Creator.

The second problem with this argument against divine creation is the difficulty in determining whether biological structures are in fact suboptimally designed. It may be that we are just too ignorant to appreciate the wisdom of a particular design.

[W]e are far from understanding the complexity of individual organisms, let alone the entire ecosystem in which that organism lives. What appears to be less than optimal design to us with our limited knowledge may actually be an optimal design when the entire system is considered. Consider the thickness of armor plating on the side of a warship. Since the purpose of such plating is to protect the ship from the puncture of an incoming warhead, it is advantageous to make the plating as thick as possible. Yet the plating on actual warships is much thinner than it could be made. The reason is, of course, that an increase in plating thickness makes the ship heavier, and thus slower. A less mobile ship is more likely to get hit more often and less likely to get where it is needed when it is needed. The actual thickness of armor on a warship is a tradeoff -- not so thin as to make the ship too easily sinkable, and not so thick as to make the ship too slow. We know too little about the complexity of organisms and the environment in which they live to conclude that any one particular feature is actually less than optimal. (Wise, 221-222.)

This seems to be the case with the claim that the vertebrate retina could be designed more efficiently. As one examines the structure in detail, the design appears exquisite.³² At the very least, the charge of suboptimality is debatable.

³² See, for example, Ayoub, "On the Design of the Vertebrate Retina," <http://www.arn.org/docs/odesign/od171/retina171.htm>; Gurney, "Is Our 'Inverted' Retina Really 'Bad

Acknowledging (*arguendo*) the possibility that the vertebrate retina may be optimally designed for land creatures, Dr. Theobald asserts that such a retina in fish is undoubtedly suboptimal (needlessly complex) because "the more elegant, more efficient, less complex cephalopod eye could perform underwater functions equally as well." But, as the cited articles make clear, it is by no means certain that a verted retina could perform underwater functions equally as well as an inverted retina. Perhaps the cephalopod eye is deliberately designed for less acute vision for larger ecological purposes.

A system of life has many requirements. Not every organism needs the most perfect vision, wings, or hands. Not every organism can be at the top of the food chain. A system of life requires organisms with different capabilities and different positions in the overall scheme of things. Perhaps a system of life requires, for its survival, some organisms that are "imperfect"? (ReMine, 27.)

The analysis of optimality is further complicated by the possibility the niches and ecosystems occupied by creatures today may not correspond to the original niches and ecosystems for which they were created. What was an optimum design in one world may not be appreciated as such in another.

The suggestion that universal common ancestry would be falsified by "the discovery of a mammal without crossed gastrointestinal and respiratory tracts, or a reptile or mammal without blindspots in its eyes" is incorrect. It is another example of taking what is known not to exist and claiming that evolution predicts it could not exist.

A theory that can tolerate the creation of novel structures and accommodate the radical alteration of a reptilian respiratory system into an avian system³³ can surely

Design?" <http://www.trueorigin.org/retina.htm>; and Bergman, "Inverted Human Eye a Poor Design?" <http://www.asa3.org/ASA/PSCF/2000/PSCF3-00Bergman.html>.

³³ Denton describes the differences this way:

No lung in any other vertebrate species is known which in any way approaches the avian system.

Just how such a different respiratory system could have evolved gradually from the standard vertebrate design without some sort of direction is, again, very difficult to envisage, especially bearing in mind that the maintenance of respiratory function is absolutely vital to the life of the organism. Moreover, the unique function and form of the avian lung necessitates a number of additional unique adaptations during avian development. As H. R. Dunker, one of the world's authorities in this field, explains, because first, the avian lung is fixed rigidly to the body wall and cannot therefore expand in volume and, second, because the small diameter of the lung capillaries and the resulting high surface tension of any liquid within them, the avian lung cannot be inflated out of a collapsed state as happens in all other vertebrates after birth. In birds, aeration of the lung must occur gradually and starts three to four days before hatching with a filling of the main bronchi, air sacs, and parabronchi with air. Only after the main air ducts are already filled with air does the final development of the lung, and particularly the growth of the air capillary network, take place. The air capillaries are never collapsed as are the alveoli of other vertebrate species; rather, as they grow into the

handle the segregation of an airway and the removal of a blind spot. If push came to shove, one could always argue that Mammalia and/or Vertebrata were not monophyletic. Whatever difficulties an evolutionary explanation may pose, it would be considered more reasonable than denying "the fact of evolution."

PREDICTION 16: MOLECULAR SUBOPTIMAL FUNCTION

The principle of imperfect design should apply to biomolecular organization as well.

Presumably, the alleged prediction and fulfillment are:

1. If universal common ancestry is true, then some organisms will have biological molecules that are not designed most efficiently for the function they perform.
2. Some organisms have biological molecules that are not designed most efficiently for the function they perform.

Since this is the concept of suboptimal design applied to biological molecules, much of the preceding response is applicable. It is not a prediction of the hypothesis of universal common ancestry or the more specific hypothesis of neo-Darwinism that organisms will have biological molecules that are not designed most efficiently for the function they perform. Evolution can accommodate suboptimal design, but it can also accommodate its absence.

This is more negative theology in the guise of science. The claim is that God would never create in such a way as to leave the kinds of inefficiently designed biological molecules that we find today. Of course, even if that were true, it would not mean that all living things descended from a common ancestor, which is the proposition being argued.

In any event, the only example of a suboptimally designed biological molecule offered by Dr. Theobald is DNA. He claims it is suboptimally designed because the vast majority of an organism's DNA purportedly is "junk," sequences that have no function. So the argument against divine creation is: (a) God would never create DNA that contained nonfunctional sequences; (b) the DNA of all organisms contains nonfunctional sequences; (c) therefore, God did not create the DNA of organisms (and hence did not create living things). There are several problems with this argument.

First, the assertion that God would never create DNA that contained nonfunctional sequences is unprovable. Even if the nonfunctional sequences were present in the original creation, the most one could say is that one cannot perceive a reason for God's having created them. One's assessment of the likelihood of there being an inscrutable purpose behind the phenomenon will depend largely on one's concept of God.

lung tissue, the parabronchi are from the beginning open tubes filled with either air or fluid. (Denton 1998, 361.)

Second, if God endowed organisms with an ability to adapt (within limits) to changing environments and/or if he allowed an originally perfect creation to degenerate as a result of human rebellion, then useless sequences in the DNA of modern organisms would be consistent with divine creation. In that case, one who claims suboptimality must retreat to the assertion that DNA which allows the accumulation of nonfunctioning sequences is less "efficiently designed" than DNA which includes a mechanism for the complete elimination of those sequences. But that is nothing more than an opinion.

Third, it is by no means clear that the DNA sequences alleged to be nonfunctional are in fact nonfunctional. Several years ago, Denton noted that "the idea that [most DNA] is really junk is now under increasing attack." (Denton 1998, 290.) More recently, molecular geneticist Linda Walkup wrote:

'Junk' DNA is thought by evolutionists to be useless DNA leftover from past evolutionary permutations. According to the selfish or parasitic DNA theory, this DNA persists only because of its ability to replicate itself, perhaps because it has randomly mutated into a form advantageous to the cell. The types of junk DNA include introns, pseudogenes, and mobile repetitive DNAs. But now many of the DNA sequences formerly relegated to the junk pile have begun to obtain new respect for their role in genome structure and function, gene regulation and rapid speciation. (Walkup, 18.)³⁴

Evidence of functionality in "junk DNAs" supports geneticist Todd Wood's hypothesis that, at one time, repetitive and mobile DNA elements served to facilitate rapid diversification within created kinds. Walkup describes his theory this way:

Since these elements are capable of rapid change of the genome, and can even be transmitted horizontally between species, [Wood] proposes that God designed them to move about or recombine in the genomes of organisms to allow the rapid intrabaraminic diversification seen in the 500 years or so after the Flood. He sees their role as being designed to act for a limited period of time, after which they would be inactivated by mutation or repression by other regulatory elements. He proposes that such elements should be renamed Altruistic Genetic Elements (AGEs) to emphasize that their purpose is different than that proposed for 'selfish' DNA.

The AGEs are hypothesized to work by activating dormant genes or inactivating active genes, or by horizontally transferring genetic information between species or possibly baramins with AGEs in the form

³⁴ The article is available online at www.answersingenesis.org/home/area/magazines/tj/tjv14n2_junk_dna.pdf. See also, Richard Deem, "When 'Junk' DNA Isn't Junk" at <http://www.jps.net/bygrace/evolution/junkdna.html> and Jaan Suurkula, "Junk DNA," <http://www.psrast.org/junkdna.htm>.

of mobile elements. The phenotypic changes would be primarily cosmetic, such as variations in size and coloration, or would involve activation of a complex of genes needed to utilize a new environmental niche, like the Arctic fox's adaptation to cold. . . .

If, for example, the proposed AGEs were at work in the diversification of equines, we have the testable prediction that differences in size, morphology and coloration could be traced back to the genetic level by mobile or repetitive DNA elements located near genes controlling coloration. Pseudogenes and relic retroviral sequences could then be the result of the action of an AGE gone wrong after its designed activity began to fail. (Walkup, 27.)

Walkup's conclusion points out the plasticity of evolutionary theory with regard to "junk DNA." She writes:

The fact that functions are being found for junk DNAs fits in well with creation science, but was not predicted by evolutionary theory, though of course the theory is being adjusted to accommodate the data. The intricate flexibility and specificity of these 'junk' DNA sequences are a strong testimony to a Creator who plans and provides for the future of his creation. (Walkup, 28.)