

CREATION AND EVOLUTION

Introduction

Are creation and evolution compatible? That depends a lot on what we mean by “creation” and “evolution.” Let me illustrate with a story from my own experience. I was brought up to believe that evolution is a historical and scientific fact. When I became a Christian, I didn’t at first question this belief. Sometime later, I attended a debate about the truth of evolution between some university science professors and Creationists. With much anticipation, a friend and I went to hear the facts and arguments each side could marshal—eager to learn the Truth. But the professors cut the legs out from under the discussion within the first two minutes, by insisting on a definition of “evolution” similar to the following: “that the characteristics of organisms change in response to their environment.” The debate disintegrated into two sides arguing over completely different issues. I felt cheated. So lest you feel cheated, too, let’s define our terms before we go further.

Defining Our Terms

Characteristics of organisms *do* change in response to their environment. That is an observable fact which is about as controversial as saying that the sun is hot. I will refer to the process by which these changes occur as **microevolution**. Microevolution causes changes **within species**,¹ as various characteristics are favored or disfavored by the environment. For example, bacteria develop resistance to antibiotics, because the naturally resistant strains of bacteria reproduce and gradually replace the non-resistant strains, which are killed by the antibiotics. The European Peppered moth (*Biston betularia*) in England changed colors over time—dark moths became much more plentiful during the industrial revolution, when factory soot created a blacker environment (making dark moths harder for predators to see). Microevolution has been documented many times, in various studies. The professors sought to limit “evolution” to microevolution, knowing full well that this would ensure victory in the debate. But they were also avoiding the real issue.

Microevolution is not what most people think of as “evolution.” When people talk of evolution, they are usually at least referring to **species evolution**. By this, I mean the production of new species through entirely natural means. But for Charles Darwin, it meant much more. Darwin hypothesized that complex living organisms gradually developed from simpler organisms, through small genetic mutations and the mechanism of natural selection. Darwin’s theory is that random genetic mutations would cause small changes in living organisms, and that some of these changes would confer a reproductive advantage, resulting in the spreading of that beneficial change. (For example, wings that enable a bird to fly would allow it to find food and avoid

predators, giving it a better chance to survive and reproduce. The result, presumably, would be more and more birds that can fly.) The accumulation of small changes over time would eventually result in a new species. The accumulation of still more changes would produce more and different species. Darwin believed that in this manner, single-celled organisms had gradually evolved into multicellular organisms, which evolved into creatures of greater and greater complexity—including, ultimately, mankind. I will refer to this concept—that complex organisms evolved, **through entirely natural means**, from simple organisms—as “**Darwinian evolution.**”

A related question is the “origin of life” issue: where did life come from in the first place? Those who accept Darwinian evolution usually contend that life also **originated** through entirely natural means, through a series of chemical reactions. I will therefore include this belief—that life originated through entirely natural means—as part of Darwinian evolution.

The purpose of this article is *not* to disprove Darwinian evolution, because I believe that is impossible. Darwinian evolution, as we shall see, is not subject to proof or disproof, because it is ultimately a faith position. By “faith position,” I mean a belief in something (or someone) that can never be objectively verified or proven to a reasonable certainty—in other words, something that must ultimately be accepted on faith. A faith position cannot be disproved because the target keeps moving. If you believe in little green men from outer space, that is a faith position. We can discuss the facts underlying your belief, such as whether a particular UFO sighting was a real alien, a natural phenomenon, or a figment of someone’s imagination. But even if I debunk 20 or 2,000 UFO sightings, I cannot disprove your belief that the aliens are “out there” somewhere—we just haven’t found them yet. As we will see, the same is true of Darwinian evolution. But more on that later. First, we must take a brief look at the other side of our coin—Creation.

Creation

The first two chapters of Genesis say that God created the earth and everything in it in six days, and then rested on the 7th day. If you insist on a literal interpretation of everything in the Bible, you will have trouble reconciling Genesis with what science tells us about ancient earth and the life it contained. However, there are several very good reasons why the first two chapters of Genesis should not be taken too literally.

First, God drops a hint in 2 Peter 3:8: “But do not let this one fact escape your notice, beloved, that with the Lord one day is as a thousand years, and a thousand years as one day.”² (Psalm 90:4³ is similar.) So does this mean that God created the world in 6,000 years, rather than in six days? No. It means that God is not obsessed about time—like we are—because He is eternal. He doesn’t grow up, grow old, or

die. So one day or 1,000 years or a hundred-million years are equally important, or unimportant, to God.

Now let us examine Genesis more closely. We measure a “day” by the rising and setting of the sun. From one sunrise to the next is one day. For the Israelites—for whom Genesis was written—each new day began at sunset. But in Genesis 1:14-19, the sun was not created until the 4th day.⁴ The first three “days” had no sunrise or sunset, so they were not “days” as we think of that term. This is another clue that chapters 1 and 2 of Genesis should not be taken too literally.

Next, think of God’s purpose in giving us the Bible. It is not a history text or a scientific treatise. The Bible reveals things about God to His people. It tells us who God is and how we should respond to Him. God never intended Genesis to be a scientific explanation of the process of Creation, because that was irrelevant to His purpose.

Similarly, who is God’s audience? If Moses is the author of Genesis, as tradition says, then he wrote it at a time when the Israelites were just beginning their spiritual walk with God, having only recently received the Law after being freed from slavery in Egypt. Even if Moses was not the author, Genesis was written before the prophets or Solomon’s proverbs or David’s psalms, and of course long before the teachings of Jesus or the events of Pentecost. In terms of spiritual maturity, the Israelites were babies. God, in His mercy and humility, chose to speak to them in a way they could understand. Creation is one of God’s greatest miracles. The Israelites would have been hopelessly confused and overwhelmed by a sophisticated, scientific description of it. We don’t try to teach physics, biology, and biochemistry to infants—and neither did God.

The first two chapters of Genesis teach one basic truth: that we, and everything around us, were created by One who is good and powerful, and who intended this world to be better than it has turned out.⁵ With that in mind, let’s return to Darwinian evolution.

Darwinian Evolution: Fact or Theory?

Is Darwinian Evolution a fact or a theory? First we must be clear about what is a “scientific fact.” The university professors drove home to me the truth that a “scientific fact” is really a very limited concept. True science is based on the principles of **experimentation and testing, observation, and verifiability**. A scientific fact must have been **tested**, usually through **experimentation**. The experiment seeks to eliminate all variables which could affect the outcome, except the one variable which is being tested. The results of the experiment must then be carefully and accurately **observed**. (Of course, sometimes careful **observation** alone is sufficient, such as when biologists are studying animals in their native habitat, or

when geologists are studying rock formations.) Finally, nothing is accepted as scientific fact unless other scientists are able to **verify** it, by obtaining the same or substantially similar results using the same methods and procedures. An experiment or an observation which cannot be duplicated and verified by others is immediately discredited.

Regardless of how the evidence for and against Darwinian Evolution is weighed, one thing is clear: while microevolution is a well-established scientific fact, Darwinian evolution is not—and never will be. We cannot test, observe, or verify a past event—such as how life originated and developed—unless someone invents a reliable time machine.

On the other hand, Darwinian evolution **is** a theory, in the scientific meaning of that word. To scientists, a “theory” is a reasoned—and generally an accepted—explanation for the observable scientific facts. The National Academy of Sciences defines a “theory” as “a well-substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypotheses.”⁶ Unlike facts,

theories are not “proven” but are corroborated, rejected, or modified in light of new data and how well they agree with accepted theories and principles.⁷

Darwinian evolution is a theory, and a widely accepted theory at that. But a theory is not a fact. If it were, it would be **testable** and **verifiable**. Ultimately, no matter how scientists try to dress it up, a theory is an opinion. And even widely held opinions can be wrong. At one time, a large number of people believed that the sun revolved around the earth. This opinion was based on their observation of the sun’s apparent movement across the sky. People made a logical deduction from the observed facts—and they were wrong. In discussing Darwinian evolution, we must always be careful to distinguish between scientific fact and scientific theory.

The Three Assumptions Underlying Darwinian Evolution

Unfortunately, many scientists who accept Darwinian evolution are not so careful with their terminology. They speak of it as established “fact,” which only religious idiots would doubt.⁸ Here are two examples:

Evolution is a fact. . . . Where there is legitimate debate it is over the mechanisms by which evolutionary change occurs. There are ways by which genetic change can take place by mechanisms other than natural selection and scientists argue about the relative importance of these, as

they do about the rates of evolutionary change. Such arguments are the legitimate business of science, leading to hypothesis, experiment, observation and conclusion. They should not be confused with doubts about whether or not evolution has occurred.⁹

The creationist movement is part of a triumphal New Ignorance that rules in many places, the United States more than most. In fact, the majority of those determined to tell lies to children believe in Darwin's theory and understand how it works, without noticing.¹⁰

Even when Darwinian evolutionists try to be humble about their subject, their arrogance often bleeds through. Note how a Darwinian evolutionist defends the theory by comparing it to gravity, as if the former were as unassailable as the latter:

Evolutionists are widely perceived as uncritical ideologues, devoted to suppressing all doubt about evolution. It's easy to see how this impression arose: evolutionists, after all, spend most of their public lives defending Darwin against endlessly recycled creationist arguments. So of course we appear hide-bound reactionaries. (So would physicists if the theory of gravity were dragged into court every other year.)¹¹

Such arrogance seems to spring from three erroneous assumptions. The first is that the existence of microevolution proves Darwinian evolution. For example, Mr. Steve Jones (the author of the quote about “those determined to tell lies to children,” above) cites the example of the human immunodeficiency virus (HIV) as proof of Darwinian evolution. Science tells us that the HIV has mutated in recent times from an animal virus into the deadly version that causes Acquired Immunodeficiency Syndrome (AIDS) in humans. But is this truly an example of an organism mutating into a different species, or merely a species changing its characteristics—like the black Peppered moth becoming dominant in England? Either way, this is a far cry from fish changing into land animals, or apes into men.

Another assumption seems to be that the only Creationist alternative to evolution is a literal interpretation of Genesis. This assumption sets up a Creationist straw man that is easily discredited by commonly accepted scientific beliefs, such as the age of the Earth. An intellectually honest person finds it difficult to believe that the earth is less than 10,000 years old when science provides abundant evidence that our planet's age must be much older.¹² However, I have already discussed several

reasons why I believe a literal interpretation of Genesis is both unnecessary and unwise.

But the third assumption is the most critical: that there is no creative God who can or does intervene in nature—or that if there is, He is irrelevant to this discussion. This assumption, if accepted, leads to the inescapable conclusion that nature alone must be responsible for the origin and development of life on earth.¹³ Darwinian evolution provides the most credible explanation—and perhaps the only credible explanation to date—for how this could have occurred in the absence of a creative God. But the Darwinian evolutionists have reached this conclusion by refusing to consider the only other credible explanation: that life originated and developed by the hand of God.

Of course, practicalities require that scientific investigation function in an atmosphere devoid of divine intervention, for such intervention is inherently unpredictable. Science can only determine what unaided nature will do, not what God will do. Yet ignoring God for some limited purposes is quite a different matter from denying or ignoring His existence altogether.¹⁴ When scientists accuse Christians of embracing ignorance and telling lies to children, then the time has come to expose Darwinian evolution for what it is: a faith position, no different in its essentials from faith in God or faith in Jesus Christ.

However, some scientists seem to have decided that the Darwinian evolutionists' faith is misplaced. They have concluded that nature alone cannot account for the development, the diversity, or the incredible complexity of life on earth, and therefore that some type of creative intelligence must have been involved in the process. If you want to read more about the science for and against Darwinian evolution, I've included an Appendix that summarizes such topics as the fossil evidence, DNA, instincts, convergence, and altruism. But for the purposes of this discussion, let's focus on two of the biggest problems for Darwinian evolution: time and biochemistry.

The Problem of Time

Darwinian evolution relies heavily on the vast amounts of time available for life to evolve. As George Wald, a biologist, said: "Given so much time the 'impossible' becomes possible, the possible probable and the probable virtually certain."¹⁵ But has there been **enough** time? In his book, *The Planetary Mind*, Arne A. Wyller says no. Here's why.

The Origin and Complexity of Life

The building blocks of life are: (1) sugars, for energy; (2) fatty acids, which are essential components of cell membranes; (3) amino acids, from which proteins

are constructed; ¹⁶ and (4) nucleotides, which form DNA. The simplest living organism, the prokaryote, ¹⁷ contains all of these, and performs all essential life functions, such as food ingestion, digestion, elimination of waste products, and reproduction. To perform these functions, the prokaryotic cell contains many specialized structures. ¹⁸ Still more complex is the eukaryotic cell, which contains a nucleus to house the DNA.

In 1952, a young graduate student at the University of Chicago, Stanley Miller, reported the results of an experiment that made headlines. Using a simulated pre-life earth atmosphere of methane, ammonia, and water (formed by mixing hydrogen with carbon, nitrogen, and oxygen), a pool of water, and sparking electrodes (to simulate lightning), Miller produced several kinds of amino acids—the building blocks of the proteins used by living organisms. Subsequent experiments were able to generate almost all of the 20 amino acids utilized by living organisms, and Darwinian evolutionists were certain they were on the road to discovering the secret to the origin of life on earth. But further experimentation has not only failed to solve the origin-of-life riddle, but has made the problem even more difficult to solve.

Proteins can be easily generated from amino acids, but not without special conditions, controls, and procedures of human design. When experiments seek to simulate evolutionary conditions, proteins do not form. Indeed, water strongly inhibits the formation of proteins from amino acids, because a molecule of water must be **removed** as each amino acid is joined to a protein chain. But even in dry conditions, proteins do not form. Some experiments have been able to generate “proteinoids” (molecules similar to proteins, but not true proteins), but these experiments are not generally accepted as valid in the scientific community because they utilize conditions not likely to have been present on pre-life earth.

The complexity of the cell itself also presents tremendous difficulties for the Darwinian evolutionary theory about the origin of life. When the cell was viewed as a simple, homogenous organism, it was not hard to visualize a bacterium randomly forming from organic molecules available in pre-Cambrian waters. But how does a cell with many specialized structures randomly form? Sir Fred Hoyle, a British astronomer, aptly described it “as ridiculous and improbable as the proposition that a tornado blowing through a junk yard may assemble a Boeing 747.” ¹⁹

The first prokaryotic cell appeared as early as 3.8 billion years ago, or about 400 million years after the Earth became hospitable enough to support life. Using mathematical probabilities, Mr. Wyller calculates that random chance would require “a time span vastly larger than the presently estimated age of the Universe” to produce the necessary complexities for the creation of this simplest of life forms. ²⁰ The creation of life through nature alone seems even more improbable when we consider the complexity and fragility of DNA.

The DNA for a single-celled bacterium contains “1 million bits of information—the equivalent of 125,000 words, or a 500-page book with 250 words of instructions on each page.”²¹ Human DNA is a thousand times more complex than bacteria DNA.

When an organism dies, the proteins that make up DNA soon begin to break down into the component amino acids. For this reason, intact DNA is never found in fossils, even in those that are well-preserved in very cold or very dry climates. Consider this statement from an admittedly pro-Darwin source: “Most creatures have a complex system of enzymes that repair DNA, which is such an unstable chemical that it would decay without constant help.”²² So how did the first DNA form on its own if its nature is to quickly break apart?

The Development of Life

But the questions for Darwinian evolution do not end with the creation of life. After the appearance of the first prokaryote, more than two billion years passed before the first eukaryotic cell came along (about 1.4 billion years ago). The amoeba, a typical single-cell eukaryote, contains a distinct cell nucleus and about a dozen organelles which perform specialized functions within the cell. If nature needed more than two billion years to produce the “simple” complexity of an amoeba-like organism,²³ how does Darwinian evolution explain the emergence of between 200 million and two billion multicellular species in only the past 700 million years?

The development of multi-cellular life forms was a much more complicated matter than simply joining individual single-celled organisms. Probably beginning with the jellyfish, multicellular organisms consisted of cells which were interdependent—that is, the individual cells were no longer capable of living apart from the whole. Proteins were needed to bind the individual cells together—such as pectin in plants, and collagen, elastin, and reticulin in animals. Cellular diversification was also necessary, since cells in multicellular organisms perform different functions: “Even the simplest of multicellular forms are made up of several different kinds of cells, whereas the most complex ones may harbor as many as 200 different types of cells.”²⁴ And the complexities of sexual reproduction, which began about 1.1 billion years ago, often required a great deal of cell specialization.

Yet even bigger problems remain for the Darwinian evolutionist. As Mr. Wyller points out, the development of life on earth at times seems to move at breathtaking speed compared to the emergence of “simple” life forms like single-celled organisms. About 100 million years ago, a wide variety of flowering plants appeared—not gradually, as Darwinian evolution would postulate, but with such rapidity that paleobiologists refer to it as “explosive radiation.”²⁵ The first

amphibian, the lungfish, developed lungs and limbs for crawling on land about 350 million years ago, only 50 million years after the first jawed fish. The reptiles came along about 70 million years later, fully able to live and reproduce on land because of their watertight skin and hard-shelled egg. The first mammal appeared about 80 million years after the first reptile, with at least two incredible innovations: a warm-blooded metabolism that allowed it to live in colder climates and hunt for food at night, and the amazing placenta that nourishes the developing young in the warmth and relative safety of their mother's body.

And then there is the problem of Hawaii. The oldest of the major Hawaiian islands, Kauai, is only five million years old, while the youngest—Hawaii, also known as "The Big Island"—is about one-fifth of that age. Yet the islands have a wide variety of plant life that is found nowhere else on earth—80 such species on the Big Island alone. How has this diversity evolved in such a relatively short amount of time?

Mr. Wyller does not believe that Darwinian evolution can adequately explain this seeming acceleration in the development of life:

Every new turn of evolutionary breakthroughs is more and more complex and occurs in a shorter and shorter time span. When we take this fact into account, the outlandishness of the chance hypothesis becomes more and more flagrant and improbable.²⁶

The Development of Human Intelligence

The most remarkable development of all (except perhaps life itself), the incredible human brain,²⁷ has developed with unbelievable speed. Modern man's brain is three times the size of that of *Australopithecus*, who first appeared only four million years ago.²⁸ Such rapid development seems remarkable enough by itself. But the problem is compounded by the effects of population growth. Until about 10,000 years ago, "[mankind's] total numbers do not appear to have exceeded a few thousand at any one time."²⁹ This presents Darwinian evolution with a paradox:

Chance operates on the genetic blueprint of each human individual either by altering one genetic code letter in a gene (a point mutation) or by reshuffling gene segments (sexual recombination). No matter how the detailed arithmetic is worked out to arrive at the total number of genetic changes in these 25 billion people [the estimated number who have lived in the past one million years], the incontrovertible fact remains that over half of these people have lived

on Earth during the last 4,000 years. Yet during these four millennia no fundamentally new brain faculties have been created, nor has any significant growth of brain volume taken place. *If chance was the creative agent in the distant past, why not in the last 4,000 years?*³⁰

Indeed, other sources indicate that the evolutionary stagnation of *homo sapiens* may have lasted much longer than a mere 4,000 years:

What is certainly known is that classical Neanderthal populations were replaced in Europe about 50,000 years ago by forms skeletally indistinguishable from ourselves. Around the same period, modern forms of man were appearing throughout the Old World including Australia.³¹

The strangest thing about human evolution is how little there has been. Nothing else is so widespread and nobody fills so many gaps in the economy of nature. Many animals carry out tasks almost as wonderful as those achieved by ourselves, but through biology rather than intellect. For them, success at one task means failure at all others. In the past hundred thousand—in the past hundred—years, human lives have been transformed, but bodies have not.³²

Are we then to believe that Darwinian evolution, operating on only a few thousand individuals at a time, over the course of only a few million years,³³ manufactured the most sophisticated organ possessed by any living creature?³⁴ Mr. Wyller is understandably skeptical:

Now that we have examined the brain, with its culmination in the development of the human brain over only 2 million to 3 million years, we see the Darwinian paradigm face its most formidable challenge: accounting for the appearance of human intelligence by a pitiful few throws of the dice.³⁵

And next we turn to an even bigger challenge to Darwinian evolution.

Biochemistry

Charles Darwin published his book, *On the Origin of Species*, in 1859. In the following 100 years, scientists in different fields came to accept the basic concept of Darwinian evolution, although they often held widely varying views of how it was

supposed to have worked. In the mid-1950's Neo-Darwinism arose as an attempt to produce a consistent view of Darwinian evolution across the various branches of science. But they left one out—biochemistry, because the technology to study structures within the cell did not then exist. Now it does.

Biochemical evidence is the biggest obstacle to the theory of Darwinian evolution to date. This is because Darwinian evolution is based on the premise that complex organisms can gradually develop from simple organisms, through small mutational changes. Yet in recent years, biochemistry has revealed that so-called “simple” organisms such as bacteria are exceedingly complex, and that the differences between bacteria and even the simplest multicellular plants and animals are huge.

Think of it this way. Can you jump over a ditch that is three feet wide? If you are relatively young and in reasonably good shape, that should be no problem. And that is all that Darwinian evolution claimed was involved in the gradual development of life on earth. But what if that ditch you must jump is really 100 feet wide? or 1,000 feet wide? That is what biochemistry has done to Darwinian evolution. The small jumps which Darwinian evolution postulates have turned out to be huge canyons. But before we go further, let's understand a couple of basic ideas.

Minimal Function and Irreducible Complexity

In his book, *Darwin's Black Box: The Biochemical Challenge to Evolution*, Michael J. Behe points out that any mutational change in an organism must have “minimal function” in order for natural selection to favor it. In other words, the new biological system must be able to satisfactorily perform the task required of it, or the system will fail to promote survival of the organism.

For example, if a mutational change comes up with a sophisticated new process for clotting blood **that doesn't work**, the animal will bleed to death, will not reproduce, and the mutational change will die out. It does no good to argue that in another 100 generations, after further mutational changes, this process will actually result in an improvement to the organism. The mutational change will die out long before it can become beneficial. Natural selection will not favor any change which does not **immediately** contribute to survival.

Mr. Behe also employs the term “irreducible complexity,” by which he means: “a single system composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning.”³⁶ All necessary parts of an irreducibly complex system must come into existence **at once**, because if any of its component parts is missing, the whole will not perform its required function. And recall that if the system lacks “minimal function,” natural selection will not favor it.

The gradual development of an irreducibly complex system through incremental steps would seem to be impossible. For example, if I need four components to produce an effective blood clotting system, the mutational development of any one component without the other three does me no good. The animal still bleeds to death. I need all four, and **I need all four to “evolve” at the same time**. But Darwinian evolution doesn’t work that way. Such a development would not be Darwinian evolution—it would be a miracle. For this reason, any irreducibly complex biological system poses very serious problems for Darwinian evolution. So are there any irreducibly complex biological systems? In fact, there are many. Let’s turn to a few examples.³⁷

The Cilium

A “cilium” is a hair-like projection from a cell which is used for locomotion or for moving liquids over the cell. In simple terms, the cilium is composed of three parts: (1) eleven cylindrical, parallel microtubules made from a protein called “tubulin”; (2) several other proteins which bind the microtubules together; and (3) a “motor protein,” called “dynein.” Without any one of these 3 components, the cilium will not function: (1) the microtubules form the structure of the cilium; (2) the binding proteins keep the microtubules together as a whole, creating the cilium’s back-and-forth movement when the microtubules are excited; and (3) the motor protein makes the whole structure move. If any one of these components were produced through Darwinian evolution, it would not be favored for reproduction because it has no minimal function—any one of these components is useless without the other two. But if all three were suddenly created at the same time, that would be equivalent to a miracle.

So how do Darwinian evolutionists explain how the cilium is supposed to have “evolved” in a gradual step-by-step manner? So far, they can’t. But the problems get even worse for the Darwinists. The cilium actually contains more than 200 different kinds of proteins. And the simplest independent life form we know of—the bacteria—has a kind of rotary propeller that it uses for locomotion (called a “flagellum”) that is even more complex than the cilium. As with the cilium, no one has been able to demonstrate how such an irreducibly complex structure could be the result of gradual Darwinian evolution.

Blood clotting

The seemingly simple process of blood clotting actually involves many different proteins, which are triggered one after another, in a kind of “cascade” of protein activation. This complex system apparently ensures that blood clots are triggered only when needed, and only to the extent they are needed. Here is how it all

works. When an animal is wounded and bleeds, blood clotting is triggered in two ways:

(1) Intrinsic. A protein called Hageman factor sticks to cells near the wound. Another protein, called HMK, converts this bound Hageman factor to an active form. The active Hageman factor then converts another protein, prekallikrein, to its active form, kallikrein. Kallikrein then helps HMK to catalyze (speed up) the conversion of more Hageman factor. Hageman factor and HMK together activate a protein called “PTA.” Activated PTA and another protein, “convertin,” activate a protein called “Christmas factor.” And the activated Christmas factor protein, in combination with another protein, “antihemophilic factor,” activate a protein called Stuart factor. More about Stuart factor in a minute.

(2) Extrinsic. A protein called tissue factor is present only in cells which do not normally come into contact with blood. An injury which causes blood to contact these cells activates tissue factor. Meanwhile, activated Hageman factor (we met that in number (1)) helps a protein called “thrombin” to convert the protein proconvertin into its active form, convertin (we also met that in number (1)). Convertin and tissue factor activate the protein Stuart factor (again, see number (1)).

Here the two paths converge. The activated Stuart factor converts a protein called Prothrombin into its active form, thrombin (which we met in number (2)). Thrombin performs several functions—(A) as we saw in number (2), it helps produce more convertin, which in turn activates more Stuart factor, thereby speeding up the clotting process; (B) it activates a protein called “accelerin,” which in turn helps Stuart factor produce thrombin at a much faster rate; and (C) most importantly, thrombin activates “fibrinogen,” a fibrous protein which actually forms the blood clot. (The system actually gets a little more complicated than this, because thrombin’s dormant form, prothrombin, must be modified by Vitamin K and an enzyme before Stuart factor and accelerin can convert it to thrombin. But that is overkill.)

The last four proteins in this “cascade” form an irreducibly complex system. Without fibrinogen, thrombin, or Stuart factor, no clot is formed, and without accelerin the clot forms much too slowly and the animal bleeds to death. **None of these proteins perform any function outside of blood clotting**, so a mutation that created one, two, or even three of the proteins would not provide “minimal function,” and would thus be eliminated by natural selection, according to Darwinian theory. So it appears that all four proteins must have been placed in service at the same time. But a mutation that created all four proteins in a single generation would be virtually unexplainable in terms of Darwinian evolution alone. Such a mutation would be miraculous.

By the way, the entire system gets even more complicated when you consider the many proteins which are involved in: (1) stopping the blood clotting process; (2) hardening the clot; and (3) gradually removing the clot.

Other Irreducible Complexities

Mr. Behe describes in detail other biological systems which are irreducibly complex, but which I will mention only in passing:

(1) We talked earlier about the many parts that make up a single “simple” cell (see, for example, footnote 17). These parts are interdependent and irreducibly complex. Indeed, the absence of a single protein in the cellular system can be fatal.

(2) The immune system must recognize and destroy invaders, while distinguishing them from friendly tissues. Its many components must all function together as a unit or the organism dies.

(3) AMP is a nucleotide which is one of the basic building blocks of DNA. The manufacture of AMP by a cell involves 13 steps, 12 enzymes, and various molecules that the cell uses to provide the component parts of AMP. None of the 9 molecules formed during this process serve any purpose other than the manufacturing of AMP, and several of these 9 molecules are chemically unstable—meaning that they would not normally be found in nature, because they would immediately fall apart or react with other molecules.

Besides these, there are many other irreducibly complex biological systems, such as: DNA replication; photosynthesis; electron transport; telomere synthesis; transcription regulation; biosynthesis of lipids, vitamins, and larger amino acids; etc.

The Darwinian Evolutionists’ Response

H. Allen Orr, a strong critic of Mr. Behe’s book, concedes the existence of irreducible complexity, but argues that these biochemical systems gradually evolved from simpler systems, just as a heart or a lung gradually evolved from more primitive organs, and that what we have now is merely the irreducibly complex **end result** of that evolution. Unfortunately, the question Mr. Orr does not answer is the very one Mr. Behe insists is critical: **how** did this happen? Mr. Orr concedes that “we have no guarantee that we can reconstruct the history of a biochemical pathway.”³⁸ If Darwinian evolutionists cannot demonstrate how this irreducible complexity occurred through unaided nature, then Mr. Orr’s explanation—that somehow it just gradually developed—must be taken on faith. In this case, Mr. Orr relies on his faith that someday, somehow, science will find answers to this mystery. And therein lies the problem with the Darwinian evolutionists’ reply to Mr. Behe—indeed, the problem with all of their arguments. They ask us to put our faith in

science, while in the name of science they denounce the most credible alternative explanation for the facts—God—because it is based on faith.

Did You Know We Were Playing a Game?

Douglas J. Futuyma, another scientist who is critical of Mr. Behe, points out that irreducible complexity is everywhere, and then uses this as a reason to denounce Mr. Behe's position:

. . . these are but a tiny fraction of the “irreducibly complex” molecular adaptations to be found among vertebrates, insects, plants, and other forms of life. Behe, then, must be forced to see the designer's handiwork everywhere. Life must present him with countless instances of supernatural intervention—of miracles.

When scientists invoke miracles, they cease to practice science. Were a geologist to cite plate tectonics, a chemist hydrogen bonds, or a physicist gravity as an instance of the miraculous, he or she would be laughed out of the profession. Moreover, they would not be doing their job, which is to seek answers by posing and testing explanatory hypotheses.³⁹

Mr. Futuyma's argument is flawed in at least two particulars. First, plate tectonics, hydrogen bonds, and gravity are all phenomena which are well understood and readily explained by modern science. Irreducible complexity is not. Of course, the Darwinian evolutionist will respond that this may change. So the second flaw is by far the more important: plate tectonics, hydrogen bonds, and gravity are present realities, which can be studied, tested, and verified in real time. The origin and development of life are in the past. We cannot test and verify the Darwinian evolutionists' explanations for these events without a time machine. On what grounds then do we accept one untestable and unverifiable explanation (Darwinian evolution) and reject the other (God)? This is the heart of the matter, and one scientist frankly explains it as a game:

Science, fundamentally, is a game. It is a game with one overriding and defining rule:

Rule No. 1: Let us see how far and to what extent we can explain the behavior of the physical and material universe in terms of purely physical and material causes, without invoking the supernatural.

Operational science takes no position about the existence or

non-existence of the supernatural; it only requires that this factor is not to be invoked in scientific explanations. Calling down special-purpose miracles as explanations constitutes a form of intellectual “cheating.”⁴⁰

If this is a game, then Darwinian evolutionists have stacked the deck. Before the game begins, they rule God out of bounds. The only acceptable explanation for the origin and development of life becomes the “scientific” one. Now this is fine if the rules of the game are known by everyone and carefully explained up front—indeed, if everyone is told we are playing this “game.” But we must never disguise or mistake this game as a search for Truth. Nor should any denounce as ignorant or dishonest those who don’t wish to play.

What Are We to Conclude?

Personally, I see no conflict between Christianity and many commonly accepted scientific beliefs, like the idea that the Earth is billions of years old. I can even accept the possibility of species evolution—i.e., that God allows some new species to be formed through entirely natural means.⁴¹ But Darwinian evolution seems to go much further, by proscribing any role for God in the origin and development of life. That should be difficult for any Christian to swallow, because it contradicts the Bible, which says that God created life.

However, we must not confuse Darwinian evolution with scientific fact. Indeed, a significant minority of scientists like Mr. Wyller and Mr. Behe have concluded that Darwinian evolution alone is an inadequate explanation for life’s complexities, and that the answers must lie elsewhere. Some scientists have conjectured that matter is somehow able to self-organize itself and thereby catalyze the development of life. Others, like Mr. Wyller and Mr. Behe, believe that this development is being assisted by some type of intelligence. (Mr. Wyller attributes this intelligence to an impersonal “Planetary Mind Field,” whereas Mr. Behe believes that this intelligence is God.)

So why do adherents of Darwinian evolution speak as if they alone possess a monopoly on truth in this field? Perhaps many reasons could be given, but I believe it all boils down to this: for most, Darwinian evolution has become their paradigm, their philosophy, or even their religion. Scientists holding this position reject, ignore, or ridicule those who believe otherwise. Mr. Wyller correctly identifies this as faith, no different in its fundamentals than religious faith: “the past and present states of evolutionary theory bear much more resemblance to religious faith than to hard-nosed natural science.”⁴²

I believe we must attribute most, if not all, of species creation to God. He was responsible for the origin and development of life. And certainly the uniqueness of mankind—our emotions, our intellect, our reason, our spirit—is God’s handiwork. As Genesis says, He created us in His image.

Finally, the choice between Christianity and Darwinian evolution is **not** a choice between religion and science. Darwinian evolution derives its credibility from the sciences from which it had its birth: geology, paleontology, biology, etc. However, Darwinian evolution is neither testable nor verifiable, and therefore cannot qualify as scientific fact. This is really a choice between two different faiths: those who believe that science can find all the answers, and those who believe there are some answers only God can provide. Count me among the latter.

APPENDIX: The Science For and Against Darwinian Evolution (or, What Your Science Teacher Never Taught You About Evolution)

Scientists who accept Darwinian evolution do so because it provides a credible explanation for the observable and verifiable scientific facts. So what are those facts?

The Real Effect of Natural Selection

As noted above, natural selection clearly results in changes **within species**, when characteristics (e.g., coloration, size, etc.) are favored or disfavored by the surrounding environment. From this, Darwin deduced that natural selection, in combination with genetic mutations accumulated over time, could also cause new species to arise. Yet this is essentially a leap of faith. While the characteristics of species can change in response to the environment, the evidence indicates that when circumstances reverse themselves, so do the favored characteristics. Remember the English moths? When the environment changed back to its original, clean state, the lighter moths again became dominant. Not only do we lack hard evidence that natural selection can create the kinds of changes Darwin envisioned, but evidence is mounting that the primary effect of natural selection is to keep an organism from changing (i.e., for the worse, resulting in extinction) by eliminating harmful mutations.⁴³

In addition, I believe many proponents of Darwinian evolution exaggerate and oversimplify the impact of natural selection. Even if some mutations are potentially beneficial, they will not necessarily be favored by natural selection. We can all see how flight confers a tremendous advantage on birds, insects, and bats, enabling them to escape enemies and find food, and therefore reproduce in greater abundance than their flightless competitors. But virtually all Darwinian evolutionists will concede that wings had to develop gradually, and that flight was not possible until late in their development. The reproductive advantage of early “wings” that did not enable flight must have been very small indeed. Yet a mutation that confers only a slight advantage—which will be true of most, if not all, “beneficial” mutations—might easily be extinguished in its infancy if its bearer succumbs to an early death as a result of disease, accident, predators, the presence of a harmful mutation, or a variety of other calamities. Thus, many mutations which are potentially beneficial will not survive, either because they are not beneficial enough, or because their recipient is simply unlucky. Think of a soldier in an army who acquires a better weapon. If all around him are fighting with swords and he obtains a gun, his chances of survival are greatly enhanced. But what if his “better” weapon is merely a slightly sharper sword? Will this improve his chances of survival significantly? Some Darwinian

evolutionists seem to treat every beneficial mutation as if it were a gun in a sword fight.

The Fossil Evidence

What scientists believe about the development of life on earth is based primarily upon fossil evidence. The oldest fossils are those of the simplest creatures, the single-cell prokaryotes, while more complex creatures are generally the more recent fossils. So far, at least, scientists haven't found creatures in completely unexpected places in the fossil record. This is certainly compelling evidence that life developed gradually—but it doesn't prove that God was not part of the process. Genesis, after all, implies that God did not do it all at once.

Fossils also reveal the existence of many creatures which are now extinct, such as dinosaurs, mammoths, and trilobites, and a few which still exist. And here, in my opinion, is where Darwinian evolutionists make their strongest case. Why have so many species gone extinct? ⁴⁴ Couldn't God get it right the first time? Did He have to learn the creative process through trial and error? I do not dismiss this possibility out of hand. Life is unbelievably complex. If God's omniscience is somehow diminished in our eyes because He worked out His plan for life on Earth with some experimentation, and sometimes changed His mind, then so be it. **He still did it.** However, I believe that God may have had reasons for these extinctions that He has not bothered to share with us.

On the other hand, Christians certainly do not have a monopoly on unanswered questions in this field. In the midst of the Darwinian evolutionist's apparent triumph, he will still find himself struggling to adequately answer many of the known facts about the fossil evidence, such as:

(1) Species in fossil records exhibit “stasis”—a lack of directional change from the time of their first appearance until their eventual extinction. ⁴⁵ In other words, fossils show that most species stay pretty much the same. ⁴⁶ There are many species alive today that have remained essentially unchanged for millions of years. The coelacanth, an ancient fish that still survives today in the waters of the western Indian Ocean, seems very much like its ancestors 400 million years ago. The same can be said of sharks and the lungfish. ⁴⁷ Seaweed is even more ancient, having been found in Chinese fossils that are more than 550 million years old. On the other hand, when changes **are** observed, they usually occur far too slowly to support Darwinian evolution.

(2) The “Cambrian explosion” (also known as “The Biological Big Bang”) is a good example of the relative suddenness with which new species turn up in the fossil records. Prior to the beginning of the Cambrian period, ⁴⁸ fossils reveal very few multicellular organisms. During the early Cambrian period, some fossil evidence

indicates that multicellular organisms are beginning to diversify—but the fossils also show that most of these are very tiny organisms. Then during the middle Cambrian, and within a period of only about 5 to 10 million years, large numbers of complex fossilized animals appear, with widely differing body plans—mollusks, brachiopods, echinoderms, trilobites, and many other bizarre creatures. Yet the fossil evidence reveals little or no trace of the evolutionary ancestors that Darwinian evolution requires. The standard Darwinian response is something along these lines:

The Cambrian Explosion, so called, is a failure of the geological record rather than of the Darwinian machine. Its radical new groups reflect not a set of exceptional events, but something more banal: the first appearance of animals with parts capable of preservation. Before then, there were soft creatures that decayed as soon as they died. *Why shells appeared all of a sudden is not certain.* Perhaps the first predators evolved and drove their prey to don expensive armor, or perhaps a surge of oxygen enabled animals to grow large enough to need a skeleton. Whatever the reason, the Cambrian marks the origin of a fossil record, rather than of modern life.⁴⁹

But of course, this answer simply prompts another equally perplexing question: why was there such an explosion of animals capable of fossil preservation within such a short time? As the author of the above quote concedes, the answer to that question “is not certain.”

(3) The fossil records contain very little evidence of the intermediate steps that Darwinian evolution postulates. For example, bird fossils do not show the gradual development of wings. Instead, wings suddenly appear intact on early bird species.⁵⁰ Only rarely do the fossil records reflect intermediate steps between species. Instead, species generally appear suddenly, fully formed and quite distinct from anything that preceded them.⁵¹ Of course, fossil records have revealed a few possible intermediates, such as: (a) rhipidistians—fish with some skeletal features resembling amphibians; (b) Therapsida—species with skeletal features that appear to be intermediate between reptiles and mammals;⁵² (c) Archaeopteryx—a fossil bird with teeth and claws, which are essentially reptilian features;⁵³ (d) so-called “ape-men,” such as Australopithecus,⁵⁴ Homo habilis, Homo Erectus, and primitive forms of Homo Sapiens—Neanderthal and Cro-Magnan man.⁵⁵ However, even after decades of fossil hunting and countless recovered fossils, the potential intermediates are still very much the exception rather than the rule.

The gaps in the fossil records⁵⁶ are so striking that some scientists have invented hypotheses to explain them, including: (1) incomplete fossil records (an

increasingly tenuous position);⁵⁷ (2) “punctuated equilibrium,” which theorizes that most evolutionary changes occur outside the general species population—i.e., on the fringes, where fossil evidence is lacking;⁵⁸ or (3) “saltation,” a sudden, macro-evolutionary change in a single generation. (Neither genetic nor experimental evidence exists to support the possibility of saltation. In evolutionary terms, it amounts to a miracle.)

Anatomical Comparisons, Sequence Comparisons, and DNA

Darwinian evolutionists point to similarities in the anatomical structures of different species of plants or animals as evidence in support of their theory. For example, the human arm is similar in skeletal structure to a bird’s wing or a whale’s flipper. Darwinian evolutionists see this as evidence that humans, birds, and whales are all descended from a common ancestor, and that the original structure was adapted by each for its own purposes—grasping, flying, or swimming.

Similarly, biologists have observed similarities and differences in the features of species for many years, and have classified species on the basis of these similarities and differences into families, orders, classes, phyla, etc. Beginning in the 1950’s, scientists were able to chart each amino acid in a protein and compare this to charts of similar proteins in other species. These are called “sequence comparisons.” Sequence comparisons showed a lot of similarity between proteins of species which were thought to be closely related, and less similarity among species believed to be more distantly related. (For example, in hemoglobin, the amino acids of humans and monkeys are identical in 141 out of 146 positions—i.e., 5 were different. Humans and horses had 17 differences; humans and chickens had 26 differences; and humans and frogs had 46 differences.) A correlation may even exist between the number of differences in some proteins and the amount of time since the two species are believed to have shared a common ancestor—a correlation which led to the “molecular clock theory,” that the correlation is caused by proteins accumulating mutations at a steady rate over time.

In recent years, technology has enabled scientists to compare the genetic structure of the DNA of different organisms. As with amino acids, many scientists believe that similarities in the DNA codes of different species indicate that they are descended from a common ancestor. In addition, some viruses appear to leave a mark upon their host’s DNA, which is then passed down to the host’s descendants. At least one author argues that the existence of such a mark in the genetic code of different species proves that they each received the mark from a common ancestor who was infected by the virus, and that in this way science can prove that whales, hippos, giraffes, and deer all shared a common ancestor.⁵⁹ Yet this same author

concedes that identical sections of DNA have also shown up in some very different species that do not appear to be closely related:

Certain genes make great leaps across the living world. Hemoglobin itself crops up in unexpected places. A few insects (such as the midge larvae found in stagnant waters) have the molecule and are able, as a result, to take up habits widely different from their allies. How did a protein from mammals get into an insect?

Vertebrate DNA also has a curious distribution. A certain piece is found in sheep, goats and cows—and in several snakes and a couple of lizards. No other animal has anything like it. An ancestor of the boa constrictor, the viper and the rattlesnake was the source from which this nomadic gene got into the progenitor of today's farm animals forty million years ago. Within both snakes and mammals, its evolution fits the standard patterns of relatedness, so that the transfer must have happened just once. Rattlesnakes and sheep pale when compared to plants. A piece of mobile DNA hidden within a gene for part of the metabolic machinery has mounted an assault on a whole range of vegetation. It started off in a fungus, but has invaded a thousand or more hosts, from coffee to foxgloves to bananas, picked off at random from the three hundred thousand kinds of plants with flowers.

Although the idea that genes can move between such different places is unexpected enough, such long-distance commerce is everywhere.⁶⁰

DNA also provides a remarkable example of stasis. According to Darwinian evolutionists, the common ancestor of frogs and fruit flies lived at least 535 million years ago. Yet a critical section of their DNA is almost identical in both:

Flies and frogs, and by inference their common ancestor in the Cambrian or before, share six hox genes. . . . [T]he two have diverged so little in more than half a billion years that scientists can snip the gene out of a fly, plug it into a frog, and it will work perfectly, triggering the development of the bottom half of a frog wherever you insert it in the embryo.⁶¹

Ultimately, the evidence of similarities among species, like the fossil evidence, is ambiguous. If we exclude the possibility of a creative Agent, then Darwinian evolution probably provides the most credible explanation for the existence of such

similarities. Yet the existence of remarkable similarities among species which are not closely related—and their omission from more closely related species—casts doubt on this hypothesis. None of this evidence proves Darwinian evolution or the absence of God’s involvement in the process. God could certainly choose to use the same pattern when creating similar species—perhaps because following that pattern was easier, or because it worked, or just because He wanted to. Darwinian evolution provides a possible explanation, but that is all.

Next we turn to some features of nature that are much harder for Darwinian evolution to explain.

How Did Natural Selection Come Up With This?

Some species display such remarkable behavior or structure that natural selection seems a weak explanation for it. For example, what shall we make of “sexual selection”—i.e., traits which are reproductively favored only because they are attractive to members of the opposite sex? A good example of this is the male peacock’s large tail feathers, which encumber his escape from predators, but which make him more attractive to peahens.

And then there are the reproductive cycles of bamboo and cicadas, which reproduce sexually only after long, but regular, intervals. Some species of cicadas emerge every 13 years to mate, while other species emerge every 17 years.⁶² Similarly, bamboo species will flower and drop seeds only at regular intervals of at least 15 years, with the interval in a few species being more than 100 years! Scientists know why this strategy works: the land is suddenly flooded with cicadas and bamboo seeds which are far too numerous for predators to consume them all, yet this occurs so infrequently that no predator can make it part of his regular diet.

The structure of a particular freshwater mussel, *Lampsilis*, is just as perplexing. Baby mussels depend on fish for the transportation that is essential to their early development. Most mussels do this by hooking onto a passing fish, using two tiny hooks. But *Lampsilis* larvae, lacking these hooks, instead lodge in a fish’s gills, entering through the mouth. How they get there is remarkable. The female *Lampsilis* has a structure on her posterior that looks very much like a small fish, even including an eyespot, tail, and flaps that move to simulate swimming. This structure attracts fish, which swallow the *Lampsilis* babies discharged by the mother mussel.

These elaborate strategies and structures should make us wonder how they could merely be the result of random mutations and natural selection. And now let us strain the believability of Darwinian evolution a bit farther.

What About Instincts?

Darwinian evolution also has difficulty explaining the development of some remarkably sophisticated instinctive behavior that occurs in nature, such as that of the giant wasp, *Pepsis marginata*, which feeds her young on the living body of the giant tarantula, *Cyrtopholis portoricae*. Somehow the wasp is able to probe the tarantula, dig a hole, and then paralyze the tarantula with a precise sting on its underside, all without any fight or flight from the big spider. How did this behavior gradually “evolve”? As Arne A. Wyller, author of *The Planetary Mind*, points out: “If the instinct is not completely developed at the beginning, the species will become extinct: either the tarantula will kill the wasp, so that the wasp will never learn to find the exact location of the spider's nerve center, or the larvae will die for lack of a food supply.”⁶³

And then there is the problem of different species that display remarkably similar instinctive behavior:

the thrush of South America lines its nest with mud, in the same peculiar manner as does our British thrush . . . the male wrens (Troglodytes) of North America, build "cocknests," to roost in, like the males of our distinct Kitty-wrens, a habit wholly unlike that of any other known bird.⁶⁴

The author of this quote presents these similar instincts as proof of Darwinian evolution. Yet the Darwinist has only two possible explanations open to him: (1) these instinctive behaviors evolved separately, or (2) these instincts have been retained, unchanged, ever since the two species diverged. (The author of the quote favors the latter.) The first would be a remarkable coincidence that seems extremely unlikely, and the second provides a stunning example of stasis—i.e., that species do not in fact change much over time. Of course, a third explanation is that these similar species were created by the same Designer, who used a similar blueprint for both.

Convergence

Convergence refers to the phenomenon in which very different species have similar anatomical structures or features. Examples of convergence in nature abound. The dolphin (a mammal), the swordfish (a fish), and the now-extinct ichthyosaur (a reptile that lived in the Mesozoic Era⁶⁵) are strikingly similar in shape and appearance. In the same way, many marsupials of Australia resemble mammals in the rest of the world, even though Australia has been an isolated island for about 100 million years. A large number of diverse and independent species have been capable of flight, including insects, reptiles, birds, and even mammals (e.g., bats).

But some similarities that have nothing to do with size and shape are even more striking. “The females of a certain moth and of the African elephant each make the same complex sex pheromone” to attract males of their species.⁶⁶ A species of beetle and a type of fly, although completely unrelated, have almost identical—and bizarre—reproductive strategies involving both sexual and asexual reproduction.⁶⁷ The Antarctic perch and the Arctic cod live at opposite ends of the globe, and are very different both structurally and genetically, yet each possesses a certain protein that enables it to survive sub-freezing temperatures.

Darwinian evolutionists contend that convergence occurs because different animals occupy similar habitats, and therefore natural selection favors the particular shape or feature that each species independently acquires.⁶⁸ For example, a Darwinian evolutionist explains the Antarctic perch and the Arctic cod in these terms:

The antifreeze is, in fact, a separately evolved adaptation in each fish. The Arctic and Antarctic proteins, specialized as each is and with almost the same structure, are not evidence of common descent but—like the furry coats of polar bears and northern plants—of a shared solution to an evolutionary challenge. Natural selection has done its job so well that it has fashioned two identical molecules at opposite ends of the earth.⁶⁹

What a remarkable coincidence that two species of fish, widely removed from each other, would randomly come up with virtually the same complex molecule to combat cold temperatures, or that a moth and an elephant would use the same molecule to attract their mates. Again, the argument of the Darwinian evolutionist, that convergence is merely the result of nature acting blindly, seems more incredible than the Christian position that these are the product of a single Designer. But if the Darwinian evolutionist’s hypothesis regarding convergence seems a bit incredible, his explanation for altruism will seem even more far-fetched.

Altruism

Altruism refers to the behavior of individuals in some species which will sacrifice their own safety, and even their own lives, for the good of the group. For example, an individual may signal danger to the rest of the group, even though the signal endangers his own survival by alerting a predator to his location. The Darwinian evolutionist can explain why this strategy works. Altruistic behavior can actually benefit an individual indirectly, by preserving his relatives—with whom he shares some genetic material. Those relatives survive to reproduce and

pass on some of his genes. An individual who saves several of his siblings—or many cousins—actually preserves more of his own genetic material than if he survived to reproduce. Of course, individuals in some species display altruistic behavior toward non-relatives. To explain this phenomenon, the Darwinian evolutionist must resort to “reciprocal altruism”: the assumption that such altruism will be returned in kind, thereby saving the individual or his kin in the future.⁷⁰

Yet how could such altruism ever evolve naturally in the real world? Natural selection, after all, is a bit of a misnomer. Nature doesn’t really “select” either species or individuals for survival. Instead, it weeds out those individuals—and to some extent, those species—which are disadvantaged (or less advantaged) in some way in the struggle for survival and reproduction. Traits, and the individuals who possess them, are successful to the extent that they are able to perpetuate their genetic material in future generations. Unsuccessful traits are eliminated.

But altruism doesn’t work that way. Suppose a genetic mutation occurs, resulting in an individual acquiring the gene for altruism, which makes him willing to sacrifice himself to preserve his relatives. When that individual sacrifices himself, he won’t reproduce, and the altruistic gene will be lost forever. To work as the Darwinian evolutionist envisions, the genetic trait of altruism must suddenly arise in multiple individuals, or else it must spread throughout a significant part of the population before it can be eliminated by self-sacrifice. The latter is surely the more likely scenario, but it presents its own difficulties. Why should such a trait be favored by natural selection before it spreads enough to be beneficial? Indeed, in its initial stages, logic dictates that such a trait would be disadvantageous, and therefore would be eliminated, because it would encourage the individual to sacrifice herself.

The “Imperfection” of Nature

I cannot end this discussion without addressing the argument that the Creationist view is untenable because it cannot account for so-called flaws or imperfections in nature. For example, why does a bird that rarely swims have webbed feet? Why do some types of bee die after using their stinger? Why do some isolated islands lack land mammals? Why do some organisms have plainly useless organs—such as the human appendix?

My first response to this argument parallels Pilate’s question to Jesus: what is “perfection”?⁷¹ If an organism is able to survive and reproduce, who are we to say that it is flawed or imperfect? If we asked God why He created life as He did, perhaps His answer would be similar to that of a Darwinian evolutionist if she were asked why natural selection should favor a peacock with large, cumbersome tail

feathers: **because it works.** The Darwinian evolutionist believes nature works well because of natural selection, while the Christian sees God's design.

But even if we admit to some "imperfection" in nature, why would we assume that God was trying to create perfection? Genesis tells us that God made His creation "good,"⁷² not perfect. If the Christian cannot fully explain why God created life as He did, the Darwinian evolutionist is no better position, for he will have just as much trouble explaining why natural selection has failed to eliminate these so-called imperfections.

Sources:

- (1) *The Field Guide to Prehistoric Life*, by David Lambert and the Diagram Group (Checkmark Books, New York, 1994)
- (2) *Darwin's Ghost: The Origin of Species Updated*, by Steve Jones (Random House, New York, 1999, 2000)
- (3) *The Encyclopedia of Animal Evolution*, edited by Professor R. J. Berry and Professor A. Hallam (Facts on File Inc., New York, and Equinox (Oxford) Ltd., 1987)
- (4) *Dying Planet: The Extinction of Species*, by Jon Erickson (Tab Books, Blue Ridge Summit, Pennsylvania 1991)
- (5) *Understanding Science & Nature: Evolution of Life* (Time-Life, Alexandria, Virginia, 1990, 1992)
- (6) *Darwin on Trial*, by Phillip E. Johnson (InterVarsity Press, Downers Grove, Illinois, 1993)
- (7) *Darwin's Black Box: The Biochemical Challenge to Evolution*, by Michael J. Behe (The Free Press, New York, New York, 1996)
- (8) *The Planetary Mind*, by Arne A. Wyller (MacMurray & Beck, Aspen, Colorado 1996)
- (9) *Ever Since Darwin: Reflections in Natural History*, by Stephen Jay Gould (W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, N.Y. 10110; W. W. Norton & Company, Ltd., 37 Great Russell Street, London WC1B 3NU, 1977, 1979; published in Canada by Penguin Books Canada, Ltd., 2801 John Street, Markham, Ontario L3R 1B4)
- (10) *Evolution vs. Creationism: An Introduction*, by Eugenie C. Scott (Greenwood Press, Westport, Connecticut and London, 2004)
- (11) "The Cambrian Explosion," from *The Evolution Library*, found at http://www.pbs.org/wgbh/evolution/library/03/4/1_034_02.html.
- (12) "Darwin v. Intelligent Design (Again)," by H. Allen Orr, *Boston Review*, found at <http://bostonreview.net/BR21.6/orr.html>.

Endnotes for “Creation and Evolution”:

¹ The simplest definition of “species” is based on reproductive ability—i.e., members of the same species are capable of mating with each other and producing young that can also reproduce. If a male and female cannot successfully mate in this way, they are of different species. Of course, this definition is only useful for species that reproduce sexually, but most of the Earth’s living organisms do reproduce in this way. (Sexual reproduction occurs when two individuals “can blend their genes to make young with elements from each.” *Darwin’s Ghost*, p. 13)

² All Biblical quotations are from the *New American Standard Bible* translation.

³ Psalm 90:4:

For a thousand years in Your sight
Are like yesterday when it passes by,
Or *as* a watch in the night.

⁴ Genesis 1:14-19 says:

Then God said, “Let there be lights in the expanse of the heavens to separate the day from the night, and let them be for signs and for seasons and for days and years; and let them be for lights in the expanse of the heavens to give light on the earth”; and it was so. God made the two great lights, the greater light to govern the day, and the lesser light to govern the night; *He made* the stars also. God placed them in the expanse of the heavens to give light on the earth, and to govern the day and the night, and to separate the light from the darkness; and God saw that it was good. There was evening and there was morning, a fourth day.

⁵ For those who question why bad things happen if God is truly good and powerful, please see the article, “Why Do Bad Things Happen?,” at this web site.

⁶ National Academy of Sciences, 1998, *Teaching About Evolution and the Nature of Science*, Washington, D.C.: National Academy Press, p. 7, as quoted in *Evolution vs. Creationism: An Introduction*, p. 14.

⁷ *Evolution vs. Creationism: An Introduction*, p. 238.

⁸ In his book, *Ever Since Darwin*, Stephen Jay Gould includes a discussion about the prejudice displayed by 19th and 20th century scientists who sought to justify white supremacy with scientific “evidence” demonstrating the evolutionary superiority of the white race. (See *Ever Since Darwin*, pp. 216-217.) Scientists are not immune to politics, biases, and unquestioned assumptions. Like the rest of us, they are merely human. We do well to remember that.

⁹ Quoted from *The Encyclopedia of Animal Evolution*, Preface

¹⁰ *Darwin's Ghost*, p. 2

¹¹ "Darwin v. Intelligent Design (Again)," by H. Allen Orr, found at <http://bostonreview.net/BR21.6/orr.html>.

¹² Scientists estimate that Earth is about four-and-a-half to five billion years old.

¹³ Another alternative is that life was introduced by an alien species from another world. But this creates a chicken-and-egg problem of where and how those aliens originated.

¹⁴ I do not mean to imply by this that all Darwinian evolutionists are atheists, or that none believe in God. I'm sure that neither is true.

¹⁵ *The Planetary Mind*, pp. 63 and 159-160, quoting *The Centre of Life*, by L. L. Cudmore (Quadrangle New York Times Book Co., New York, 1977), p. 138.

¹⁶ Proteins in living organisms are made up of various combinations of twenty different amino acids. For example, myoglobin, a protein manufactured by whales, contains 153 amino acids. About 200,000 distinct proteins exist in the various life forms on Earth. The human body uses about 100,000 different proteins.

¹⁷ Prokaryotes are single-celled organisms which lack a distinct cell nucleus. Organisms which have cells with nuclei are called eukaryotes. The only remaining prokaryotes today are bacteria and blue-green algae. The vast majority of the species which exist today—including all multi-cellular organisms, such as plants, fish, animals, and mankind—are eukaryotes. A prokaryotic cell contains about 100 million atoms. A eukaryotic cell, by contrast, is 10 to 100 times larger. Prokaryotes reproduce asexually, by simple cellular division—that is, one cell splits into two. Aside from mutations, the "offspring" is a clone of its "parent." Most eukaryotes reproduce sexually.

¹⁸ These structures include, for example: mitochondria, which produce a cell's energy; ribosomes, which manufacture proteins; the Endoplasmic reticulum, which processes proteins; the Golgi apparatus, which stores proteins until they are ready to be used elsewhere in the cell; globular and helix proteins, which play a central role in passing nutrients and waste products through the cell membrane; endosomes, which store nutrients; clathrin, a protein composed of more than a thousand amino acids, which transports nutrients within the cell; secretory vesicles, which store materials which are to be expelled from the cell; and peroxisomes, which metabolize fats. (This is far from a complete list.)

¹⁹ *The Encyclopedia of Animal Evolution*, p. 142

²⁰ *The Planetary Mind*, pp. 44-48

²¹ *The Planetary Mind*, p. 47

²² See *Darwin's Ghost*, p. 113.

²³ Admittedly, part of the delay in the development of eukaryotic organisms was due to a lack of atmospheric oxygen, which eukaryotes need to survive.

²⁴ *The Planetary Mind*, p. 79

²⁵ *The Planetary Mind*, p. 91

²⁶ *The Planetary Mind*, p. 102

²⁷ The modern human brain contains more than 100 billion nerve cells, compared with 7,000 in bees and a few hundred million in most mammals. The nerve cells of the human brain communicate with each other and with the rest of the body through both electrical and chemical means, the latter through the use of more than fifty varieties of neurotransmitter molecules.

²⁸ *Homo habilis*, which first appeared about two million years ago, had a brain half the size of modern man. Other hominid species include *Homo erectus*, which first appeared about 1.5 million years ago and disappeared about 200,000 years ago; Neanderthal, who lived from 130,000 to 30,000 years ago; and *Cro-Magnon*, which came on the scene about 90,000 years ago.

²⁹ *The Encyclopedia of Animal Evolution*, p. 130. Another author agrees: "Its [the human race's] average size over most of its history may have been a mere ten to twenty thousand people." *Darwin's Ghost*, p. 324.

³⁰ *The Planetary Mind*, pp. 139-140 (emphasis in original)

³¹ *The Encyclopedia of Animal Evolution*, p. 136

³² *Darwin's Ghost*, p. 326

³³ For those who would consider a few million years to be ample time for sophisticated evolutionary change to occur, consider this. The Mediterranean Sea has been filling and drying out throughout its history. The modern Mediterranean Sea is about five million years old. It was last created when the Atlantic Ocean filled it through the Strait of Gibraltar. When the Suez Canal opened in 1869, species from the Red Sea began to rapidly replace the native species of the eastern Mediterranean. Why? Because after five million years, the native Mediterranean species have not evolved and adapted to their warm water habitat, but instead still resemble their

cold water ancestors in the Atlantic Ocean. As one evolutionist puts it: “The locals **have had no time**—nor, in the absence of competition, much need—to respond to the challenges presented by their home's warm and salty waters since the sea last filled.” (*Darwin's Ghost*, p. 239, emphasis added)

Consider also that a few million years is far less time for human evolution than for most other species because we reproduce far less frequently. A human generation is measured in years, not days or months, since human children require many years to reach puberty, and many more years to reach full physical and sexual maturity.

³⁴ Darwinian evolution must not only account for the incredible brain development within this very short time, but also the many other differences between humans and other primates, including: (1) our spinal cord connects to the brain through a hole (the foramen magnum) in the bottom of the skull, rather than in the back of the skull as in other primates, enabling humans to stand upright and still look forward; (2) unlike other primates, our skull has a soft spot at birth and doesn't fully harden until we are adults, allowing our brains to continue to grow well after birth; (3) we have much smaller jaws and teeth, and much less prominent brow ridges, giving our face a straighter appearance; (4) our big toe is not opposable as in other primates, so it is well suited for walking upright, but not for grasping; and (5) the vaginal canal in other female primates points backward, so that males mount from the rear, whereas in humans the canal points down and forward, facilitating face-to-face coitus.

³⁵ *The Planetary Mind*, pp. 140-141

³⁶ *Darwin's Black Box*, p. 39

³⁷ These examples are summarized from the discussions in *Darwin's Black Box*.

³⁸ “Darwin v. Intelligent Design (Again),” by H. Allen Orr.

³⁹ *Evolution vs. Creationism: An Introduction*, p. 182, quoting : Futuyma, Douglas J., 1997, “Miracles and Molecules,” *Boston Review* 22 (1): 29-30. Available from <http://www.bostonreview.net/br22.1/futuyma.html>. (Emphasis added)

⁴⁰ *Evolution vs. Creationism: An Introduction*, p. 252, quoting Dickerson, Richard E., 1992, “The Game of Science,” *Journal of Molecular Evolution* 34:277-279.

⁴¹ For example, laboratory experiments have reportedly produced a new species of Venezuelan fruit fly by breeding them under controlled conditions for several years. See *Evolution vs. Creationism: An Introduction*, p. 42, citing Dobzhansky, Theodosius, and O. Pavlovsky, 1971, “Experimentally Caused Incipient Species of *Drosophila*,” *Nature* 230: 289-292. Similarly, mosquitos living in the London subway system are reportedly now a different species than their surface cousins. See *Evolution vs. Creationism: An Introduction*, p. 43, citing Byrne, Katharine,

and Richard A. Nichols, 1999, “*Culex pipiens* in London Underground Tunnels: Differentiation Between Surface and Subterranean Populations,” *Heredity* 82: 7-15.

⁴² *The Planetary Mind*, p. 150

Endnotes for Appendix:

⁴³ This is not to say—as some Christians reportedly do—that all mutations are harmful, because they are not. On the other hand, even the most ardent Darwinian evolutionist will concede that *most* mutations are harmful. For example, see *The Encyclopedia of Animal Evolution*, p. 140:

Although most mutations are harmful to their possessors, since they are random changes in a functioning organism, some are undoubtedly beneficial.

Or this:

For most of the time natural selection must act as a policeman rather than as an architect. It does not adapt every molecule to each shift in the environment, but spends its efforts on a purge of mutations that interfere with the smooth operations of the body. After all, a random change rarely improves a device that already works well.

Darwin's Ghost, p. 134.

The same is often true of hybrids—i.e., the offspring of a mating between members of two similar species—at least, among animals. Hybrid animals generally die out because they are not as well adapted to their environment as either of their parents, and thus the two species remain distinct and unchanged. See *Darwin's Ghost*, pp. 172-174. However, there are exceptions, such as the mallard duck. See *Darwin's Ghost*, p. 178. On the other hand, plant hybrids often do quite well. See *Darwin's Ghost*, pp. 183-185.

⁴⁴ According to scientists, at least five major mass extinctions—in which more than fifty percent of the then-living species became extinct—have occurred in Earth's history: (1) at the end of the Ordovician Period, about 440 million years ago; (2) at the end of the Devonian Period, about 370 million years ago; (3) at the end of the Permian Period, about 240 million years ago; (4) at the end of the Triassic Period, about 210 million years ago; and (5) at the end of the Cretaceous Period, about 65 million years ago. The species currently on Earth are believed to represent only one percent of the species that have existed since life began—the other 99% are extinct.

⁴⁵ For example, a supporter of Darwinian evolution concedes that: “The fossil record seems to indicate that life evolved by fits and starts. Many long periods of little or no change are punctuated by short periods of rapid change, followed again by long periods of stasis.” (*Dying Planet*, p. 62) Another Darwinian evolutionist observes a similar pattern:

. . . most lineages appear in the record quite suddenly. One section of marine fossils in upstate New York is typical: it stretches over a hundred million years and all its many kinds stay the same for millions of years before most alter over just a few hundred thousand. For marine fossils with a long enough history—corals, snails and small bottom-living creatures—nine tenths of all records are like that: a sudden appearance followed by millions of years of tedium until the line disappears or emerges unchanged today. A few alter slowly, in true Darwinian style, as proof that the patterns found in the others are not due to some error of sampling, but the general picture is that life is calm for most of the time. One tadpole shrimp is so static that it has kept the Latin name used for its ancestors of a million years ago, but it copes so well with the modern world that it is a pest of irrigated rice fields.

(*Darwin's Ghost*, p. 221)

⁴⁶ Even DNA provides evidence of stasis. In comparing DNA from different organisms, scientists found that “About a thousand genes are shared by every organism, however simple or complicated.” (*Darwin's Ghost*, p. 284) According to Darwinian evolution, this particular gene sequence has not evolved, or even been modified, in any organism despite more than a billion years of evolution.

⁴⁷ Other examples of these “living fossils” include: platypus, horseshoe crab, giant tortoise, Ryukyu rabbit, chambered nautilus, latimeria, neoceratodus, diverse damselfly, okapi, onychophoran, ginkgo, metasequoia, pika, and *Parnassius* butterfly. See *Understanding Science & Nature: Evolution of Life*, p. 140.

⁴⁸ The beginning of the Cambrian period is roughly between 545 million years ago and 600 million years ago, depending on the source consulted. The Cambrian period ended about 500 million years ago.

⁴⁹ *Darwin's Ghost*, p. 207 (emphasis added)

⁵⁰ The same can be said of bats: “No fossil record has been found of the transitional stage when bats began to develop wings. Similarly, little record has been found of the change of whales from land to aquatic creatures.” (quoted from *Understanding Science & Nature: Evolution of Life*, p. 115)

⁵¹ The author of *Darwin's Ghost*, a decidedly pro-Darwin work, admits:

The fossil record—in defiance of Darwin's whole idea of gradual change—often makes great leaps from one form to the next. Far from the display of intermediates to be expected from slow advance through natural selection, many species appear without warning, persist in fixed form, and disappear, leaving no descendants. Geology assuredly does not reveal any finely graduated organic chain, and this is the

most obvious and gravest objection which can be urged against the theory of evolution.

Darwin's Ghost, p. 191

⁵² However, according to at least one source, mammals did not actually descend from reptiles, but both developed from a common ancestor. See *Evolution vs. Creationism: An Introduction*, pp. 166-167, quoting Padian, Kevin, and Kenneth D. Angielczyk, 1999, "Are There Transitional Forms in the Fossil Record?," In *The Evolution-Creationism Controversy II: Perspectives on Science, Religion and Geological Education*, edited by P. H. Kelley, J. R. Bryan, and T. A. Hansen, Fayetteville, AR: Paleontological Society.

⁵³ Archaeopteryx lived about 165 million years ago. A possible intermediate between Archaeopteryx and modern birds is Unenlagia, which lived about 90 million years ago. Unenlagia was featherless and probably flightless, but had a shoulder joint like that of a modern bird's wing. A small dinosaur with a feathered tail, but no wings, has also been found. However, birds as we know them—with feathers and wings capable of flight—appear suddenly about 65 million years ago, around the time dinosaurs became extinct. (See *Darwin's Ghost*, pp. 203-205.)

⁵⁴ Australopithecus "had a brain about as big as a chimpanzee's." (quoted from *Understanding Science & Nature: Evolution of Life*, p. 124)

⁵⁵ Genesis talks of the creation of man in both Chapters 1 and 2. In Genesis 1:26-27, God makes man in His own image. Some have misinterpreted these verses to mean that God created man in His **physical** image. This cannot be correct, since God is Spirit and we are flesh. Instead, Genesis means that we are created in God's **spiritual** image, with the capacity to think, to make moral choices, and to love. Most importantly, we can choose whether or not to surrender ourselves to God, as He asks us to. (For more on this topic, see "For God So Loved . . . Well, Wait a Minute" on this web site.)

In Genesis 2:7, God breathes into man the breath of life and man "became a living being." The Hebrew word for "being" is "nephesh," which literally means, "soul." Adam was different from Australopithecus, Neanderthal, and all other ape-men in that he was no longer just an animal. Adam was a spiritual being like God, with an eternal soul. And so are all of his descendants.

⁵⁶ The existence of gaps in the fossil record is admitted by even the most devout Darwinian evolutionists. For example, consider this quote from a committed evolutionist: "Evolutionary biologists and antievolutionists are united in one respect: both agree that there are gaps in the fossil record. The record of life as seen in stone does not present a smooth, intergrading continuum from earliest times until the present, nor is there a continuum between all living things." (*Evolution vs. Creationism: An Introduction*, p. 163)

⁵⁷ Dedicated Darwinian evolutionists rightly point out that most individuals do not become fossils because conditions were not suitable at the time of their demise, that many fossils are lost

or destroyed by erosion or other geological changes after the fossils are deposited, and that many more fossils have not been found because they are in locations which are not easily accessible. Yet despite all of these problems, a great many fossils have been preserved and discovered. Mathematicians tell us that a random sampling becomes increasingly reliable as it becomes larger. Thus, a political poll that questions 10,000 people is more reliable than one that questions only 1,000 people. The same should be true of fossils—the more we find, the more reliable the fossil record should be. Note this admission from an admittedly pro-Darwin source: “That the geological record is imperfect all will admit; but that it is imperfect to the degree which I require, few will be inclined to admit.” (*Darwin’s Ghost*, p. 335)

⁵⁸ For example, Professors Berry and Hallum, authors of *The Encyclopedia of Animal Evolution*, say this (at pp. 122-123):

In recent years, however, many paleontologists have contested the idea that natural selection gradually modifies well-established species in slow but profound ways. The basis for this challenge is the observed stability of many species in the fossil record. The record reveals that many species of marine bivalve mollusks or foraminiferans (single-celled organisms resembling shelled amoebas) have survived with little change for more than 10 million years. Similar longevities are evident for species of higher land plants. These data and others for groups such as beetles, freshwater fishes and mammals suggest that, barring extinction, an average species may not undergo appreciable evolution (enough to be recognized as a new species) in the course of a hundred thousand or even a million generations.

Those who believe that species stability is the norm tend to reject the notion that large evolutionary changes occurring over millions of years result from the modification of existing species, a process that they regard as normally slow and of relatively minor consequence. They favor instead the idea that evolution is sporadic or "punctuational," being concentrated in spurts that usually occur as new species emerge rapidly from small populations of others.

⁵⁹ See *Darwin’s Ghost*, pp. 18-19.

⁶⁰ *Darwin’s Ghost*, pp. 138-139

⁶¹ *Evolution vs. Creationism: An Introduction*, p. 177, quoting Holmes, Bob, 1997, “When We Were Worms,” *New Scientist* 156 (2104): 30-35.

⁶² The fact that the intervals are prime numbers is significant, ensuring that the shorter reproductive cycles of predators will rarely coincide. If the interval were, for example, 12 years instead of 13, then a predator that reproduced every 2, 3, or 4 years might decimate every new generation of cicadas if the cycles coincided. But using a 13-year interval, the cicadas’ cycle will coincide with a 4-year predator cycle only once every 52 years (4 x 13).

⁶³ *The Planetary Mind*, pp. 128-129. Mr. Wyller's source for this information is: *Lifetide*, by L. Watson (Bantam Books, Toronto and New York, 1980).

⁶⁴ *Darwin's Ghost*, pp. 167-168

⁶⁵ The Mesozoic Era, also known as the Age of Middle Life or the Age of the Dinosaurs, lasted from about 248 million years ago until 65 million years ago.

⁶⁶ *Darwin's Ghost*, p. 291

⁶⁷ When food is scarce, the fly (Cecidomyian gall midge) and the beetle (*Micromalthus debilis*) both engage in sexual reproduction. But when food is abundant, the females of both species give birth to unfertilized young within the mother's body, which then devour her from the inside, killing her in the process. This allows for extremely rapid reproduction during times of plenty.

⁶⁸ An alternative explanation in cases of related species is that the groups were once part of a single species ranging over a large area, and became isolated by climate changes (or other environmental disruptions) which caused the extinction of members of the species in the area between the two groups. However, this explanation only works for related species, and it fails to explain why such groups often evolve so little after becoming isolated from each other.

⁶⁹ *Darwin's Ghost*, p. 292

⁷⁰ For an expanded version of the Darwinian argument in favor of altruism, see *Ever Since Darwin*, p. 255.

⁷¹ Pilate asked Jesus, "What is Truth?" See John 18:38.

⁷² See Genesis 1:4, 1:10, 1:12, 1:18, 1:21, 1:25, 1:31.