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Dedicated to

Charles Signorino, Allen Davis,
Henry M. Morris, and John C. Whitcomb,
men of science and men of God
who introduced me to the wonders of God's creation,
sorrow for my self-righteous sin,
the glorious joy of new life in Christ,
and the exhilarating freedom to build
my life and my science on the eternal foundation
of the written and Living Word
(John 1:1–3, 14).

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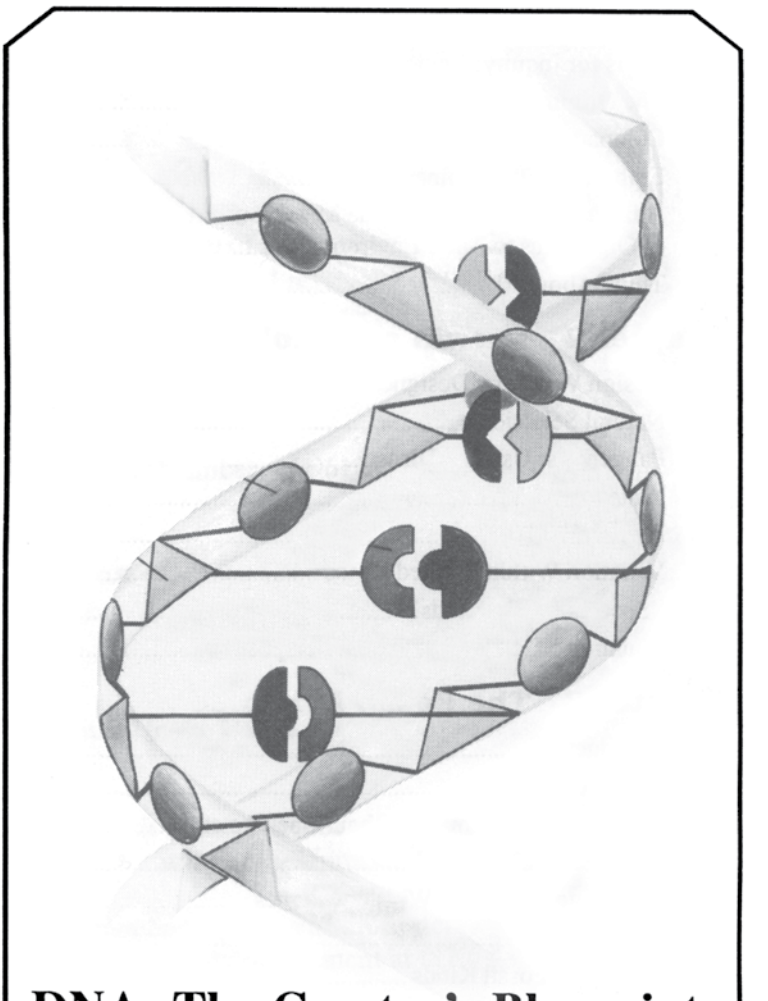


DNA: The Creator's Blueprint

Chapter 1

Evidence of Creation?

Where to Begin?

"Evolution's just a theory. We don't have to believe it, do we?" Every year at least one of my students would bring up the "evolution's just a theory" argument, but I was ready. Feeling my heart starting to race, I would respond enthusiastically, "Oh, no. Evolution's a fact, perhaps the best established fact in all of science. It's the cornerstone of modern biology, and the basis for all of our thinking about the origin, meaning, and destiny of life!"

"It's easy to prove evolution," I'd say. "Just imagine you're on a cruise around the world (all expenses paid!) with a young man named Charles Darwin." Darwin had received college training in theology, but didn't really care for Bible study. He tried medical school, but didn't do well. He did enjoy nature study, and was an avid beetle collector. Both his interest in nature and his birth into a wealthy family helped make it possible for young Charles to travel as ship's naturalist aboard the HMS *Beagle* on its five-year circumnavigation of the globe, 1831–1836 (not bad work, if you can get it!).

Sailing through the Atlantic and around South America, Darwin arrived at the now-famous Galapagos Islands, on the equator about 600 miles (960 km) west of Ecuador. While there he saw sea turtles hatch out of the eggs that had been laid in beach sand above high tide. As they scrambled toward the sea, most of the hatchlings were gobbled up by predators. Perhaps only three in a hundred of the tiny turtles made it to saltwater, and perhaps two of those were eaten up by predators beneath the waves! Maybe only one in a hundred of the turtle hatchlings survived to grow and perpetuate the species.

This cruel, wasteful, and inefficient struggle for survival made a powerful impression on young Darwin. He found it increasingly difficult to reconcile his scientific observations of deadly struggle with biblical teachings about an all-powerful, all-loving God.

On the positive side, the young man who grew up in England had been astounded by the astonishing variety and beauty of life forms he'd seen where the *Beagle* stopped for study of tropical rain forests. On the Galapagos, his attention was drawn to a fascinating group of small birds now called Darwin's finches. Some with big beaks crushed seeds to eat; some with small beaks ate insects; one variety even used spines or thorns from plants to pry insects out of their burrows in bark.

Two dozen years after his fantastic voyage, an older Darwin made his observations of variety and struggle on the Galapagos Islands the basis of an evolutionary theory that shook the world. Some have called Darwin's *Origin of Species* (1859) second only to the Bible in its influence on human history; others would put it first.

Despite the profound impact of Darwinian evolution, his theory is based, simply and convincingly I'd tell my classes, on two irrefutable observations leading to one inescapable conclusion. First, living things exist in incredible variety, and each new generation expresses a wide range of traits. Second, all living things experience an intense struggle for existence, and only a few of each generation survive to reproduce and pass on their

traits. Since there is variation and only some in each generation survive, the obvious and unmistakable conclusion is that some varieties are more likely to survive than others: **survival of the fittest!** In short form:

1. hereditary variation
+2. struggle for survival
=3. survival of the fittest

As I told my students, "Evolution is a fact; we see it going on around us every day. Does anyone doubt variation? Just look around the room, think of your parents and grandparents, or picture the many breeds of dogs, cats, horses, roses, oranges, etc. Does anyone doubt there's a struggle for survival? Think about lions pouncing on zebras, cats chasing mice, or cudzu vines destroying a forest (or getting out of bed Monday mornings). Add it up for yourself: nature 'selects' some varieties for survival rather than others. This **natural selection** of the fittest leads to evolutionary progress over time."

There is a price for this progress, however. Natural selection is based on a **struggle** to the **death,** what Darwin called the "**war of nature."** *Hereditary variability can improve only if large numbers of the less fit die in each generation.* The horrific struggle and death Darwin saw in the Galapagos had caused him to begin doubting the existence of a loving God. But, in a complete about-face, Darwin came to see death in one generation as opening doors of opportunity for the next. *What had been ascribed to the creative power of God, Darwin credited instead to the creative power of struggle and death.* In concluding the book that changed the world's world view, Darwin wrote:

Thus, from the war of nature
from famine and death,
the production of higher animals
directly follows.

Darwin included mankind among the "higher animals" produced by the evolutionary "**war of nature,**" and so did I. Rejecting the biblical teaching that mankind was a special creation made in the image of some "God," I taught that we (like microbes, plants, and "other animals") were a result of *millions of years of struggle and death.*

Nothing supernatural was required for human origins, I emphasized, but only the ordinary **process of evolution — time, chance, struggle, and death.** Time and chance produce hereditary variation **(mutations)**; struggle and death **(natural selection)** determine which variations survive. I stressed time, chance, struggle, and death (mutation-selection) so much that my students began to abbreviate it **TCSD.**

Believing it was a consequence of millions of years of struggle and death, I summarized the classic sequence and significance of molecules-to-mankind evolution as follows:

> In the beginning, the earth was quite different from what it is now. Lightning flashed back and forth in an atmosphere of methane and ammonia for perhaps a billion years, producing molecules that rained down into the ancient oceans. Then, just by chance, a group of molecules got together that could reproduce, and life on earth began.
>
> About 500 million years ago, fossils first began to form, in abundance, of those early, simple kinds of life, forms like the trilobites. About 400 million years ago, the first land plants and animals appeared in the sequence. About four million years ago, certain ape-like animals took those first upright steps toward becoming human beings.
>
> People are the first animals able to look back over the history of their own evolution. As we do so, we learn things that help us understand ourselves and our nature. Why do we do things harmful to our own kind? It's that

"jungle fight for survival" that brought us into being in the first place.

But we're not without hope. We're already beginning to take control of that molecule of heredity, DNA. Using the techniques of genetic engineering, we can re-make ourselves into our own image of what mankind really ought to be. We're already reaching for the stars. There's simply no limit to what human beings can do.

For me, "evolution" was much more than just a scientific theory. It was a total world-and-life view, an alternate religion, a substitute for God. It gave me a feeling of my place in the universe, and a sense of my relationship to others, to society, and to the world of nature that had ultimately given me life. I knew where I came from and where I was going.

I had heard Christians and other "religious fanatics" talk about "back to God, back to the Bible, back to this, or back to that." But for me as an evolutionist, the best was yet to come. And, as a scientist and professor of biology, I could help make it happen. By contributing to advances in science and technology, both directly and through my students, I could be part of the process of bringing "heaven on earth."

Let's face it. Evolution is an exciting and appealing idea! A lot of scientific evidence can be used to support it. Perhaps most importantly for me and many others, evolution means there is no God, no "Creator" who sets the rules. Human beings are the top. Each of us is his or her own boss. We set our own rules, our own goals. We decide what's best for us.

I didn't just believe evolution; I embraced it enthusiastically! And I taught it enthusiastically. I considered it one of my major missions as a science professor to help my students rid themselves completely of old, "pre-scientific" superstitions, such as Christianity. In fact, I was almost fired once for teaching evolution so vigorously that I had Christian students crying in my class!

Once in a while Christian students would say something like, "You don't have to be that hard on the Bible or the Christian faith. After all, you can believe in the Bible and evolution at the same time." Thinking I had them in a trap, I would respond something like this: "Who wants to pray to a god that used millions of years of struggle and death to create things? Aren't time and chance the logical opposites of plan and purpose? What kind of god would wipe out 99 percent of all the species he/she/it created, and bury the mistakes in fossil graveyards? Besides that, don't you Christians believe God sent His Son, Jesus, to conquer death and give us new life? If God had been using millions of years of struggle and death to create things, Jesus would be opposing God's plan! You don't really understand evolution or the Bible either one!"

Although I thought I was "open-minded" and didn't mean to be mean, my remarks must have been offensive to many Christian students. Since Christians, Jews, and Muslims share the same basic account of creation and the earth's early history, my evolutionist exuberance would have been offensive to Jewish and Islamic students as well. Actually, I was more than willing to let students believe in whatever God they wanted to — so long as their religious belief did not dispute the "scientific fact of evolution."

Then I got invited to a Bible study. How silly, I thought, that educated people in this age of science would still study a dusty old outmoded book like the Bible, but the Bible study was led by the chemistry professor where I was teaching. More importantly, I was promised free coffee and donuts for coming. Now those are three of my favorite words: free . . . coffee . . . donuts! So, for less than honorable motives, my wife, Mary, and I set off for that Bible study. Besides, I thought, by pointing out all the obvious errors in the Bible, maybe I could convince them to study something more relevant, like evolution, for instance!

Most of the errors I tried to point out turned out to be my errors. The chemistry professor, Dr. Charles Signorino, was a

superb Bible teacher, and that got to be irritating, but the free coffee and donuts kept us coming back anyway. I soon learned, much to my amazement at first, that the Bible describes the origin and history of life on earth in a way dramatically different from evolution's story:

> In the beginning was God. With plan, purpose, and special acts of creation, God stretched out the heavens and clothed the earth with plants both "pleasant to the sight and good for food." He created our first parents (Adam and Eve) in His own "image," mandated that they care for and cultivate the earth as a "garden of delight" (Eden), and asked only for their love and trust.
>
> Unfortunately, our first parents sinned — rejected God's love and put their trust in their own opinions rather than God's Word. That self-centered arrogance ruined the world God had created "all very good," and brought death, disease, and disaster to the earth — a "bondage to decay."
>
> The early earth became so filled with violence and corruption that God destroyed it in a global flood to give the world a fresh start with Noah and those with him on the ark. Sadly, human evil has again polluted God's world, and the present world is destined for cleansing by fire. We might summarize the sad history of our planet so far as 3 Cs: creation, corruption, and catastrophe.
>
> We're not without hope. There is a fourth "C." The same God who created us, the same God who daily cares for us, is the same God who sent His Son, Jesus Christ, to conquer sin and death and to raise us to new life, rich and abundant, now and forever. As "new creations in Christ," we wait for a "new heaven and new earth," where "the wolf and the lamb will lie down together," there will be no more pain, tears, or death, and peace and paradise will be perfectly restored.

The evolutionary world view can be abbreviated TCSD for time, chance, struggle, and death. The biblical view can be represented as 7 Cs (say "Seven Seas"), but I'll focus on just 4 Cs: God's perfect world (creation), ruined by man (corruption), destroyed by Noah's flood (catastrophe), restored to a new life in Christ — *creation, corruption, catastrophe, Christ.*[1]

What a difference! In evolutionary thinking, time, chance, struggle, and death produce "new and improved" forms of life. In biblical thinking, chance and struggle produce disease, decline, and death. Evolution begins with dead things; living things — including us — are temporary intruders in the universe, and when the sun burns out, death wins at last. The Bible begins with the life of God; death is a temporary intruder, and eternal life wins at Christ's return.

Most people agree that it's the Bible that has the happy ending: life triumphs over death. During an interview, a famous evolutionist and anti-creationist admitted that it would be nice to believe that we were especially created by a loving God who put us here to superintend the earth. Then he quickly added that it isn't right. During a television program in which I also appeared, another leading evolutionist told how he had grown up in a religious household and had heard the "wonderful story" of a beautiful creation, ruined by man's sin, restored by Christ's love. Then he went on to say that the whole of his scientific training, indeed the whole development of science during the last 200 years, had convinced him the "wonderful story" was wrong.

That's the way I looked at it, too; the Bible was just a story with a happy ending — like all those other fairy tales. My strong belief in evolution was a huge stumbling block to my accepting the good news of new life in Christ. I thought evolution had proved the Bible was wrong, and that there was no God out there to keep all its wonderful promises.

Dr. Signorino, an excellent Bible teacher, was also a top-notch scientist. He challenged me to look again at the scientific

evidence I thought I knew so well. Then Allen Davis, a biologist newly hired at the college, began to share creationist evidences and resources with me, including the famous (or infamous) book by John C. Whitcomb and Henry M. Morris, *The Genesis Flood*. For three years we argued creation/evolution. For three years I used all the evolutionary arguments I knew so well. For three years I lost every scientific argument. Reluctant and surprised, I finally concluded that what we read in God's Word is the surest guide to understanding what we see in God's world.

Now I'd like to invite you to consider some of the evidences that suggest the "wonderful story" is true after all! And it's not just me. Thousands of scientists are sharing the scientific evidences in God's world that encourage us to believe all the wonderful promises and principles in God's Word, the Bible.

How can that be? How can *scientists — all using the same evidence* — come up with such different ideas about what that evidence means? Hasn't "science" proved the Bible wrong? Don't we "know" that man created "God" in his image when he reached the stage of abstract thought in evolution? Wouldn't going back to believing God created man in His image bring back other superstitions and destroy the very fabric of society in our scientific age? Isn't it unconscionable (and unconstitutional) to mix religion, like the Bible, with science, like evolution?

People do get "fired up" about creation/evolution. There really are important issues at stake here, both personal and social. That's all the more reason to hold our emotions in check and to examine our beliefs calmly and thoughtfully. After all, it's important to know not only what we believe but *why we believe it.* Being comfortable and confident with our beliefs means that we have honestly considered the merits of beliefs different from ours, and understanding another's beliefs helps to generate *respect* and *compassion*, even if the disagreement is deep, profound, and absolute.

I love science. This book is especially for those who love and/or respect science. In it I'd like to share with you some of the *scientific*

evidence that helped to change me, as a biology professor, from an enthusiastic (even "evangelical") belief in evolution to a belief instead that the Bible is the best guide to understanding God's world and our place in His plan. The Bible contains no *explicit* references to DNA, mutations, fossils, or the Grand Canyon, so my scientific *applications* of biblical truths are no better than the evidence I use to support them.

I also want you to understand evolution clearly and thoroughly, so I'll also be going over with you — as I still do with my students — all the standard textbook arguments used in favor of evolution.

Take your time. Be critical. Think it through. It took me three years of re-examining the evidence before I gave up my deep-seated belief in evolution and concluded, like thousands of other scientists in recent times, that the 4 C biblical outline of earth history is the more logical inference from our scientific observations.

Tools for Inquiry: Logic and Observation

Science is both a fabulous body of knowledge and a fantastic method of investigation. Most people just assume evolution can be studied scientifically — but not creation. According to a slogan popular these days, "Evolution is science, and creation is religion," and that's supposed to stop the discussion even before it starts. Let's start, then, with the most basic question of all: Is it really possible to talk honestly and fairly about *scientific* evidence of *creation??*

For many people, that question is a major stumbling block. Some even use it as an excuse to throw creation out of the courtroom or classroom without even hearing the evidence, but nothing is really easier for scientists and just "ordinary people" than finding and recognizing evidence of creation.

To illustrate, let me borrow your imagination for a moment. Imagine that you are walking along a creek on a lazy summer afternoon, idly kicking at the pebbles along the bank. Occasionally you reach down to pick up a pebble that has an unusual shape. One

pebble reminds you of a cowboy boot (Figure 1). As you roll the pebble around in your hand, you notice that the softer parts of the rock are more worn away than the harder parts, and that lines of wear follow lines of weakness in the rock. Despite some appearance of design, the boot shape of the tumbled pebble is clearly the result of time, chance, and the processes of weathering and erosion.

But then your eye spots an arrowhead lying among the pebbles (Figure 1). Immediately it stands out as different. In the arrowhead, chip marks cut through the hard and soft parts of the rock equally, and the chip lines go both with and across lines of weakness in the rock. In the arrowhead, we see matter shaped and molded according to a plan that gives the rocky material a special purpose.

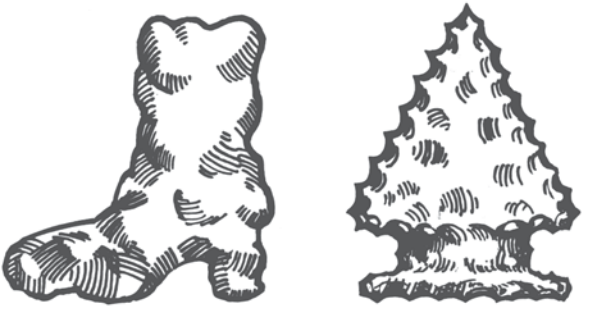
You have just done what many people dismiss as impossible. In comparing the pebble and arrowhead, you were easily able to recognize evidence of creation. I am speaking here only of human creation, of course. The arrowhead might have been carved by one of my ancestors (a Cherokee), for example, but the same approach can be used even when we don't know who or what the creative agent might have been.[2]

What does it take to recognize evidence of creation? Just the ordinary tools of science: logic and observation.

Using your knowledge of erosional processes and your observations of hard and soft rock, you were able to distinguish a result of time and chance (the tumbled pebble) from an object created with plan and purpose (the arrowhead). If we had found such objects as arrowheads on Mars, all scientists would have recognized them immediately as the products of creation, even though in that case we would have no idea who made them or how. The late Carl Sagan, the evolutionist of *Cosmos* television fame, spent millions of dollars listening for signals from outer space, because he knew full well that we can tell the difference between wave patterns produced by time and chance and those sent with design and purpose.

Pebble
Time and Chance:
Properties of Matter

Arrowhead
Design and Creation:
Properties of Organization



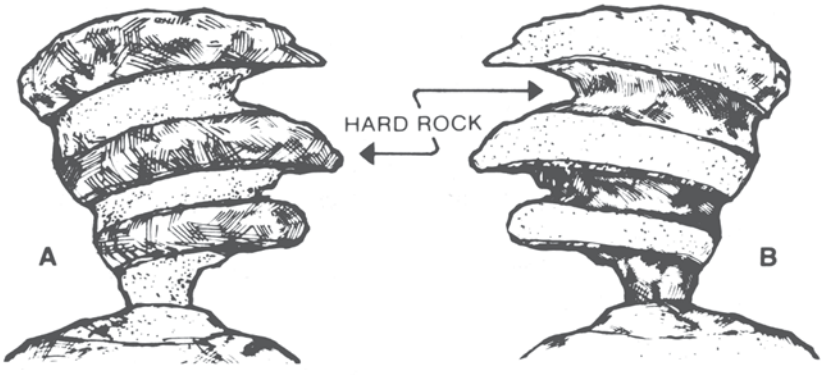


Figure 1. Try your hand at recognizing scientific evidence of creation. Both rock formations above resemble a man's head, but examine the relationship between hard and soft rock in each. Which (A or B) is more likely the result, like the tumbled pebble, of *time and chance* acting on the properties of hard and soft rock? Which is more likely the result, like the arrowhead, of plan and purpose? Can you recognize *evidence of creation* without seeing either the creator or the creative act?

I was in a friendly mini-debate at a California college when the evolutionist interrupted me: "But creation can't be scientific. Science deals only with things you can see and touch. Take energy, for example. . . ." Then he stopped. "Whoops! Made a mistake, didn't I?" I hastened to agree. He, his students, and I all knew that there are forms of energy, like gravity, that you can't see or touch or put in a bottle. Yet you know "gravity" is there (whatever it is!) because you can see the effects it has on matter. Similarly, God is a Spirit and can't be seen — but you can see His effects on matter. Even the Bible tells us that "the invisible things of God are clearly seen in all the things that have been made" (Rom. 1:20).

Note: You don't have to see the Creator, and you don't have to see the creative act, to recognize evidence of creation. Even when we don't know who or what the creative agent is, there are cases where "creation" is simply the most logical inference from our scientific observations.

Although the pebble and the arrowhead are made of the same substance, they reflect two radically different kinds of order. The tumbled pebble has the kind of order that results from time and chance operating through weathering and erosion on the inherent properties of matter. Those same factors will eventually destroy not only the pebble, but also the arrowhead, which has the kind of order clearly brought into being by plan and purpose, mind acting on matter.

In a way, the tumbled pebble represents the idea of *evolution.* As I once believed and taught, evolutionists believe that life itself is the result, like the tumbled pebble, of *time, chance, and the inherent properties of matter.* The arrowhead represents the *creation* idea, that living systems have *irreducible properties of organization* that were produced, like the arrowhead, by *plan, purpose, and special acts of creation.*

In our daily experience, all of us can differentiate these two kinds of order (inherent and *"exherent"*). On the basis of logic

and observation, for example, we recognize that wind-worn rock formations are the products of time, chance, and the inherent properties of matter. Those same techniques (logical inference from scientific observations) convince us that pottery fragments and rock carvings must be the products of plan, purpose, and acts of creation giving matter irreducible properties of organization.

Let's suppose for a moment you are willing to agree, even tentatively and reluctantly, that "creation" (the model, the process, and the products) *can* be studied scientifically. Does that mean you have to be (shudder) a "creationist?" Not at all! Indeed, there were a couple of teachers at a California university convinced, as I am, that creationist ideas can be tested scientifically — but they thought that scientific tests proved them false! So we can agree ahead of time that both classic models of origin, creation and evolution, can be compared on the basis of scientific merit, but that still leaves it up to me to convince you that the bulk of scientific evidence available supports the Bible, not evolution.

So far, we've only agreed to discuss, to "reason together." Now, let's apply these ordinary scientific techniques to the study of living systems. When it comes to the origin of life, which view is the more logical inference from our scientific observations? Time, chance, and the evolution of matter? Or plan, purpose, and special acts of creation?

The Origin of Life: DNA and Protein

The two basic parts of the tumbled pebble and the arrowhead we considered are hard and soft rock. Two basic parts of every living system are DNA and protein.

DNA is the famous molecule of heredity. It's a focus of crime scene investigations, and we often hear news stories about it. This is the molecule that gets passed down from one generation to the next. Each of us starts off as a tiny little ball about the size of a period on a printed page. In that tiny ball, there are over six feet (2m) of DNA all coiled up. All of our physical characteristics (height, skin color, etc.) are "spelled out" in that DNA.

What are proteins? Proteins are the molecules of structure and function. Hair is mostly protein; skin cells are packed full of proteins; the enzymes that break down food and build it up are proteins; the filaments that slide together to make muscles work are proteins.

So DNA and protein are two basic "parts" of every living system. When you get down to a virus, that's all you find — DNA and protein. (In some viruses, RNA substitutes for DNA.) The DNA molecules code for the protein molecules that make us what we are. That same principle applies to all life forms: viruses, plants, and animals, as well as human beings.

My students study all of the details,[3] but DNA and protein molecules are really quite simple in their basic structure. If you can picture a string of pearls, you can picture DNA: it is a chain of repeating units. Figure 2-A is a diagram of a DNA molecule. The parts that look like railroad boxcars are sugar and phosphate groups, and the parts that stick out from each boxcar in the chain are groups called *bases.*

Proteins are built in about the same way. Proteins are also chains of repeated units. As shown in Figure 2-B, the links in protein chains are called *amino acids.* In all living things, inherited chains of DNA bases are used to line up chains of amino acids. These amino acid chains are the protein molecules responsible for structure and function. For example, chains of several hundred DNA bases tell the cell how to make a protein called hemoglobin, and that protein functions as the oxygen carrier in red blood cells. In short form, *DNA →protein →trait,* and that relationship is the physical basis of all life on earth.

Now, what about that relationship between DNA and protein? How did it get started? Evolutionists picture a time long ago when the earth might have been quite different. They imagine that fragments of DNA and fragments of protein are produced. These molecules are supposed to "do what comes naturally" over vast periods of time. What's going to happen? Will time, chance,

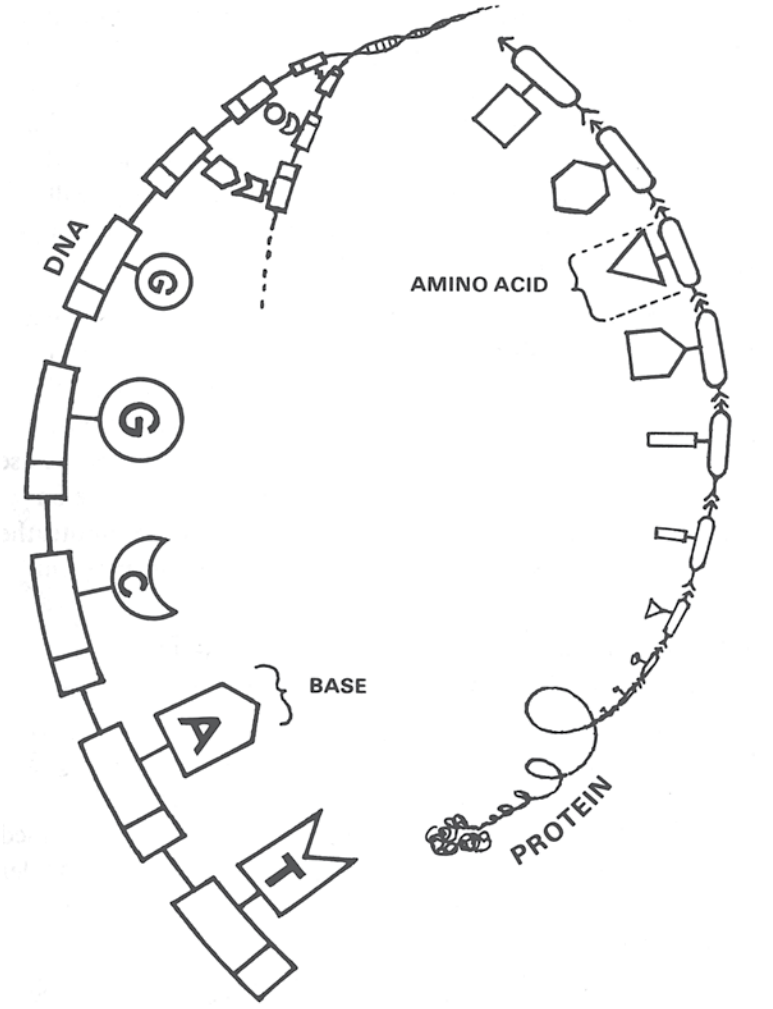


Figure 2-A. *DNA* is built like a string of pearls, whose links (specifically the *bases* G, C, A, and T) act like alphabet letters that "spell out" hereditary instructions.

Figure 2-B. *Proteins* are chains of *amino acids*. Each chain coils into a special shape that has some special function: muscle contraction, digestion, oxygen transport, holding skin together, etc.

and chemical reactions between DNA and protein automatically produce life?

At first, you might think so. After all, nothing is more natural than a reaction between acids and bases. Perhaps you've used soda (a base) to clean acid from a battery. The fizz is an acid-base reaction. So is using "Tums" to neutralize stomach acid. Nothing is more common than reactions between acids and bases. If you just wait long enough, acid-base reactions will get DNA and protein working together, and life will appear — right? Wrong! Just the opposite.

The problem is that the properties of bases and acids produce the *wrong* relationship for living systems. Acid-base reactions would "scramble up" DNA and protein units in all sorts of "deadly" combinations. These reactions would prevent, not promote, the use of DNA to code protein production. Since use of DNA to code protein production is the basis of all life on earth, these acid-base reactions would *prevent,* not promote, the evolution of life by chemical processes based on the inherent properties of matter.

These wrong reactions have produced serious problems for Stanley Miller, Sidney Fox, and other scientists trying to do experiments to support chemical evolution. Almost all biology books have a picture of Miller's famous spark chamber (Figure 3). In it, Miller used simple raw materials and electric sparks to produce amino acids and other simple molecules — the so-called "building blocks of life." Some newspapers reported that Miller had practically made "life in a test tube."

Miller's experiment was brilliant, and I loved to tell my students about it. Then I came to see there were just three little problems: he had the wrong starting materials, used the wrong conditions, and got the wrong results.

What do I mean by "wrong starting materials"? Miller left out oxygen. Why? Because of the scientific evidence? No. He left it out because he knew oxygen would destroy the very molecules he

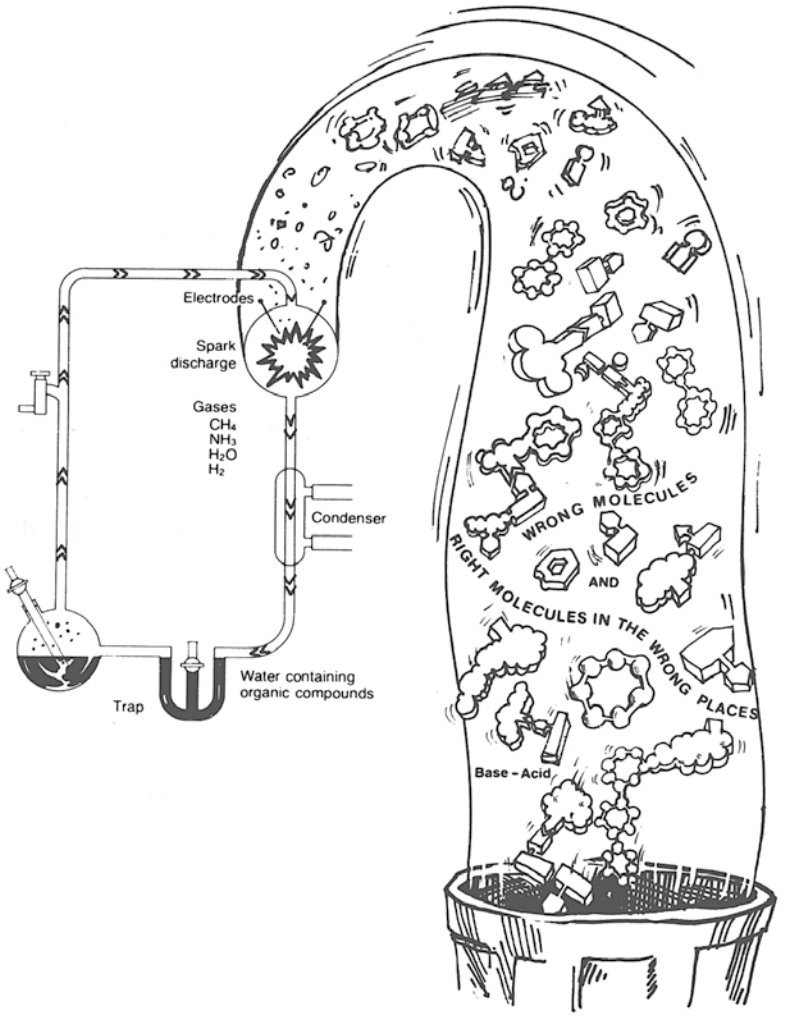


Figure 3. Left to time, chance, and their chemical properties, the bases of DNA and amino acids of proteins would react in ways that would prevent, not promote, the evolution of life. In the same way, reactions among molecules in Miller's famous "spark chamber" would destroy any hope of producing life. Living systems must constantly repair the chemical damage done to them, and when biological order loses out to inherent chemical processes, death results — even though a dead body has all the right molecules in the right places in the right amounts at the right times (almost!).

was trying to produce. It's hard for us to realize how "corrosive" oxygen is, since most modern living things depend on it. But oxygen is so valuable to life precisely because it's so chemically reactive, and aerobic living things today have systems to protect themselves against the harmful effects of oxygen, while using its chemical power to their advantage. (Anaerobic organisms and some viruses are quickly destroyed by contact with oxygen.)

A.I. Oparin, the Russian biochemist who "fathered" modern views of spontaneous generation or chemical evolution, knew oxygen in the atmosphere would prevent evolution. He also "knew," by faith in Engels' materialistic philosophy (the view that matter is the only reality), that creation was impossible (there was no spiritual dimension). As an act of faith, then, Oparin believed evolution must have occurred, and as a concession to his faith, he left oxygen out. Science has not been kind to that belief. We find oxidized rocks, suggesting an oxygen atmosphere, as deep as we can dig.

Furthermore, methane (CH_4) and ammonia (NH_3), two prime gases in the Miller spark chamber, could *not* have been present in large amounts. The ammonia would be dissolved in the oceans, and the methane should be found stuck to ancient (deep) sedimentary clays. It's not there! Those who still believe in chemical evolution are aware of these problems (as is Miller himself), so they are simply trying (as yet unsuccessfully) to simulate the origin of life using different starting materials. (Carbon monoxide and hydrogen cyanide are two popular, if unlikely, gases being used today.)

Wrong conditions? Miller used an electric spark to get the gas molecules to combine, and that works. Problem: The same electric spark that puts amino acids together also tears them apart, and it's much better at destroying them than making them, meaning that few, if any, amino acids would actually accumulate in the spark chamber. Miller, a good biochemist, knew that, of course, so he used a common chemist's trick. He drew the products out

of the spark chamber and into a "trap" that would save the amino acids from destruction by the same electric spark that made them. Using product removal (the principle of LeChatelier or law of mass action) to increase yield is ordinary chemical practice, but it depends on intervention by informed intelligence. Miller was supposed to be demonstrating that the gases could make the "building blocks of life" all by themselves without any outside help, yet *his* outside, intelligent help was necessary to save the molecules from their destructive chemical fate. (Moreover, creating life in a test tube as a consequence of intelligent design would offer more support to creation than to evolution.)

Wrong results? How could that be? Miller wanted to make amino acids, and he got amino acids (along with sugars and a few other things). How could those results be wrong?

The proteins in living cells are made of just *certain kinds* of amino acids: those that are "alpha" (short) and "left-handed." Miller's "primordial soup" contained many long (beta, gamma, delta) amino acids and equal numbers of both right- and left-handed forms. Problem: Just one long or right-handed amino acid inserted into a chain of short, left-handed amino acids would prevent the coiling and folding necessary for proper protein function. What Miller *actually* produced was a seething brew of potent poisons that would absolutely destroy any hope for the chemical evolution of life.

The "left-handed amino acid problem" is particularly well-known to evolutionists, and several have been trying to solve it. One brilliant researcher, after working unsuccessfully for years on the problem, just smiled and chuckled when asked about it: "Perhaps God is left-handed." He may have been closer to the truth than he realized. From what we know about the chemistry of the molecules involved, it really looks like the molecules could never put themselves together into living cells apart from the careful selection, engineering genius, and deliberate design of the transcendent, creative intelligence we call God![4]

Chemistry, then, is not our ancestor; it's our problem. When cells lose their biological order and their molecules start reacting in chemical ways, we die. A dead body contains all the molecules necessary for life and approximately the right amount of each, but we never see a "road kill" get up and walk off because sunlight energy shining on the carcass made all the molecules of life start working together again. What's lost at death are balance and biological order that otherwise use food to put us together faster than chemistry tears us apart! (See Bliss and Parker[5]; Illustra Media[6]; and Thaxton, Bradley, and Olsen[7] for details.)

Time and chance are no help to the evolutionist either, since time and chance can only act on inherent chemical properties. *Trying to throw "life" on a roll of molecular dice is like trying to throw a "13" on a pair of gaming dice.* It just won't work. The possibility is not there, so the probability is just plain *zero.*

The relationship between DNA and protein required for life is one that no chemist would ever suspect. It's using a series of bases (actually taken three at a time) to line up a series of R-groups (Figure 4). R-groups are the parts of each amino acid that "stick out" along the protein chain. "R" stands for the "variable radical," and variable it is! An R-group can be acid; it can be a base; it can be a single hydrogen atom, a short chain, a long chain, a single ring, a double ring, fat-soluble, or water-soluble!

The point is this: There is no inherent chemical tendency for a series of bases (three at a time) to line up a series of R-groups in the orderly way required for life. The base/R-group relationship has to be *imposed on* matter; it has *no basis within* matter.

The relationship between hard and soft rock in the arrowhead in Figure 1 had to be imposed from the outside. All of us could recognize that matter had been shaped and molded according to a *design* that could not be produced by time, chance, and weathering processes acting on the hard and soft rock involved. In the same way, our *knowledge* of DNA, protein, and their chemical

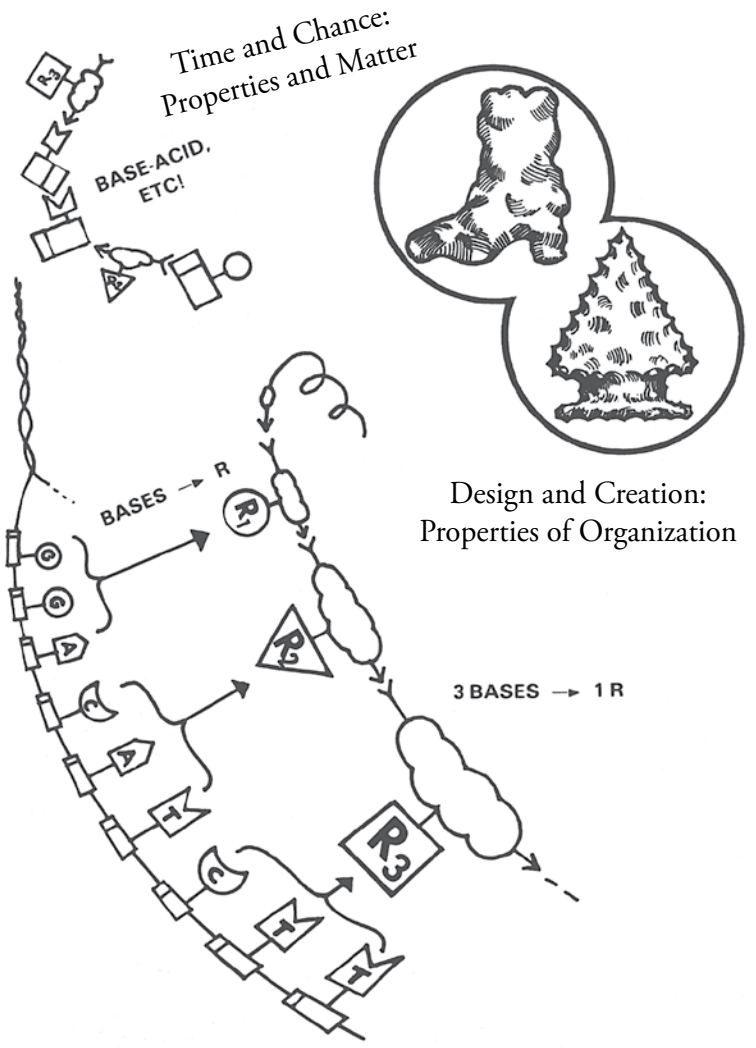


Figure 4. All living cells use groups of three DNA bases as code names for amino acid R-groups. But all known chemical reactions between these molecules (e.g., base-acid) would prevent, not promote, development of this coding relationship. Is the hereditary code, then, the logical result of time, chance, and the inherent properties of matter (like the water-worn pebble), or does it have the irreducible properties of organization (like the arrowhead) that scientists ordinarily associate with plan, purpose, and creative acts?

properties should lead us to infer that *life also is the result of plan, purpose, and special acts of creation.*

Let me use a simpler example of the same kind of reasoning. Suppose I asked you this question: Can aluminum fly? Think a moment. Can aluminum fly? I'm sure that sounds like a trick question. By itself, of course, aluminum can't fly. Aluminum ore in rock just sits there. A volcano may throw it, but it doesn't fly. If you pour gasoline on it, does that make it fly? If you pour a little rubber on it, that doesn't make it fly, either. Suppose you take that aluminum, stretch it out in a nice long tube with wings, a tail, and a few other parts. Then it flies; we call it an airplane.

Did you ever wonder what makes an airplane fly? Try a few thought experiments. Take the wings off and study them; they don't fly. Take the engines off, study them; they don't fly. Take the pilot out of the cockpit; the pilot doesn't fly. Don't dwell on this the next time you're on an airplane, but an airplane is a collection of non-flying parts! Not a single part of it flies!

What does it take to make an airplane fly? The answer is something every scientist can understand and appreciate, something every scientist can work with and use to frame hypotheses and conduct experiments. What does it take to make an airplane fly? *Creative design and organization.*

Take a look at the features of a living cell diagrammed in Figure 5. Don't worry; I am not going to say much about this diagram. Just notice the DNA molecule in the upper left circle and the protein in the lower right. What are all the rest of those strange looking things diagrammed in the cell? Those represent just a few of the molecules that a cell needs to make just one protein according to the instructions of just one DNA molecule. A cell needs over 75 "helper molecules," all working together *in harmony,* to make one protein (R-group series) as instructed by one DNA base series. A few of these molecules are RNA (messenger, transfer, and ribosomal RNA); most are highly specific proteins.[8]

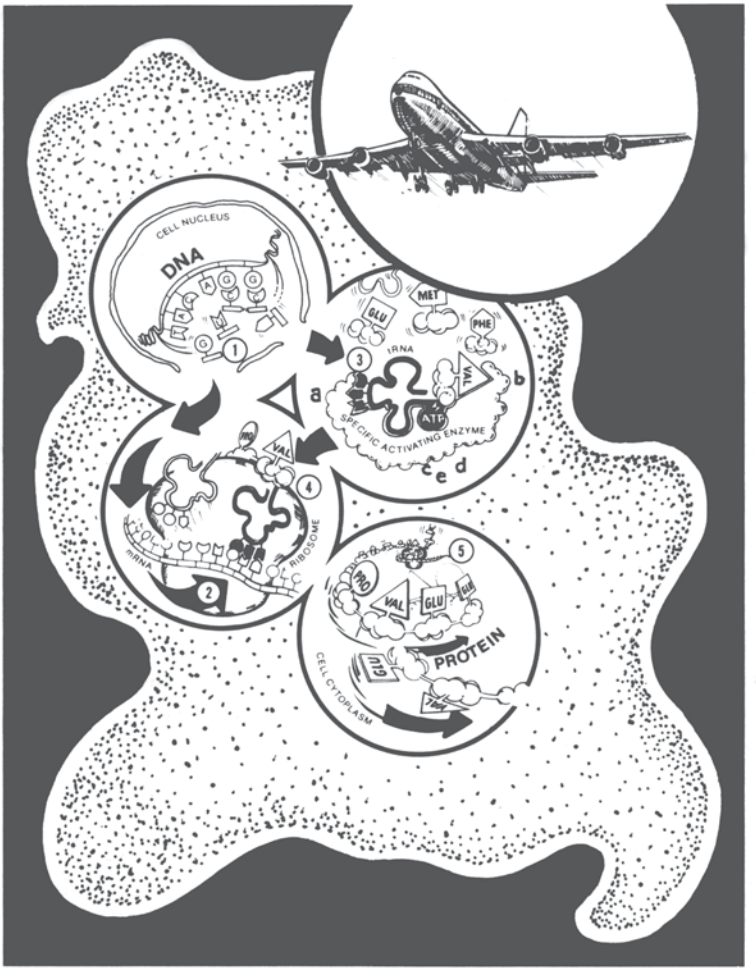


Figure 5. Living cells use over 75 special kinds of protein and RNA molecules to make one protein following DNA's instructions. What we know about airplanes convinces us that their flight is the result of creative design. What scientists know about the way living cells make protein suggests, just as clearly, that life also is the result of creative design. The real "heroes," the molecules that establish the non-chemical, grammatical/linguistic coding relationship between triplet base codons and amino acid R-groups are the set of specific activating enzymes I call "translases." (Drawing from Bliss and Parker, *Origin of Life* [Green Forest, AR: Master Books, 1979]).

Contrary to popular impression, DNA does not even possess the genetic *code* for making protein, but only the genetic *alphabet*. The "alphabet letters" of DNA (the four bases, abbreviated GCAT) are used in groups of three (triplet codons) as code names for the 20 different amino acids of proteins. But bases are equally spaced along DNA; there's nothing in the structure or chemistry that even hints why or which bases should be grouped as triplet codons. Three letter groupings are *not inherent* in base sequences; they are *imposed on* the base series by huge cellular particles called ribosomes.

Ribosomes don't act directly on DNA, but on expendable "base pair copies" of DNA called messenger RNA, or mRNA. The production of mRNA, and of more DNA for reproduction, is magnificently profound, but it's a simple consequence of interlocking base shapes and ordinary chemical attraction (mediated by enzymes). The way ribosomes establish the genetic coding system, however, completely transcends the inherent properties of DNA bases.

Ribosomes are "molecular machines" each consisting of about 50 specific proteins and three large RNA molecules. Its overall 3-D shape gives a ribosome two adjacent slots each precisely shaped to hold three and only three bases, thus establishing the triplet coding system. This coding system is not based on time, chance, and the properties of the bases, but on plan, purpose, and intelligent design. In the structure of the ribosome, however, as in the arrowhead, nothing supernatural, complex, or even unusual is involved, and the function of the ribosome is easy to understand and explain. In both the ribosome and the arrowhead, the evidence of creation is not in what we can't see and don't know; it's in the pattern of order ("exherent") that we do see and can explain: matter shaped and molded to accomplish the purpose of its Creator, not to satisfy inherent chemical properties.

Besides the above, the ribosomes which establish the amino acid code names for making proteins are themselves made of

50 or more specific proteins. It takes specific proteins to establish the code for making specific proteins, so how did the system get started? Evolutionists admit that's a problem for them because they insist evolution based on time, chance, and the properties of matter is a blind process that can't plan ahead or work toward a goal. On the other hand, creationists see the goal-oriented function of ribosomes as another evidence of creation. Like batteries can be used to start car engines that then recharge the batteries, so proteins can be used to code for the production of proteins that can then "recharge" the coding proteins.

And there's more. Even after ribosomes establish triplet codon names for amino acids, the protein building blocks have no chemical way to recognize their code names! All sorts of wrong chemical reactions between amino acids and base triplets are possible, but these would destroy the code. It falls to transfer RNA (tRNA) molecules to pick up amino acids and base pair them with their codons on the ribosome slots. The base pairing of tRNA and mRNA triplets is based on interlocking shapes and ordinary chemical attraction, but the proper pairing of tRNAs with amino acids requires much more than ordinary chemistry.

When it comes to "translating" DNA's instructions for making proteins, the real "heroes" are the activating enzymes that unite specific tRNA/amino acid pairs. Enzymes are proteins with special slots for selecting and holding other molecules for speedy reaction. As shown in Figure 5 (circle 3), each activating enzyme has five slots: two for chemical coupling *(c, d),* one for energy (ATP), and, most importantly, two to establish a *non-chemical* three-base "code name" for each different amino acid R-group *(a, b).* You may find that awe-inspiring, and so do my cell biology students!

The living cell requires at least 20 of these activating enzymes I call "**translases,**" one for each of the specific R-group/code name (amino acid/tRNA*)* pairs. Even so, the whole set of translases (100 specific active sites) would be (1) *worthless* without ribosomes (50

proteins plus rRNA) to break the base-coded message of heredity into three-letter code names; (2) *destructive* without a continuously renewed supply of ATP energy to keep the translases from tearing up the pairs they are supposed to form; and (3) *vanishing* if it weren't for having translases and other specific proteins to re-make the translase proteins that are continuously and rapidly wearing out because of the destructive effects of time and chance on protein structure!

Most enzymes are proteins that select and speed up chemical reactions that would occur slowly without them. *Translases* are an entirely different category of enzymes. They *impose a relationship* that transcends the chemistry of base triplets and amino acids, *a code that would not occur at all, slowly or otherwise, in their absence.*

Let's forget about all the complexity of the DNA-protein relationship and just remember two simple points. First, it takes *specific* proteins to make *specific* proteins. That may remind you of the chicken-and-egg problem: how can you get one without the other? That problem is solved if the molecules needed for "DNA-protein translation" are produced by creation.

Second, among all the molecules that translate DNA into protein, there's not one molecule that is alive. There's not a single molecule in your body that's alive. There's not a single molecule in the living cell that's alive. A living cell is a collection of nonliving molecules! What does it take to make a living cell alive? The answer is something every scientist recognizes and uses in a laboratory, something every scientist can logically infer from his observations of DNA and protein. What does it take to make a living cell alive? *Creative design and organization!*

Only creative acts could organize matter into the first living cells, *but once all the parts are in place, there is nothing "supernatural" or "mysterious" in the way cells make proteins. If* they are continually supplied with the right kind of energy and raw materials, and *if all* 75-plus of the RNA and protein molecules required for

DNA-protein "translation" are present in the *right* places at the *right* times in the *right* amounts with the *right* structure, *then* cells make proteins by using DNA's base series (quite indirectly!) to line up amino acids at the rate of about two per second. *In ways scientists understand rather well,* it takes a living cell only about four minutes to "crank out" an average protein (500 amino acids) according to DNA specifications.

Scientists also understand how airplanes fly. For that very reason, no scientist believes that airplanes are the result of time, chance, and the properties of aluminum and other materials that make up the airplane. Flying is a property of organization, not of substance. A Boeing 747, for example, is a collection of 4.5 million non-flying parts, but thanks to design and creation (and a continuous supply of energy and of repair services!), it flies.

Similarly, "life" is a property of *organization,* not of *substance.* A living cell is a collection of several billion non-living molecules, and death results when a shortage of energy or a flaw in the operational or repair mechanisms allows inherent chemical processes to destroy its biological order.

It's what we *do know* and *can explain* about aluminum and the laws of physics that would convince us that airplanes are the products of creation, even if we never saw the acts of creation. In the same way, it's what we *do know* and *can explain* about DNA and protein and the laws of chemistry which suggests that life itself is the result of special creation.

My point is not based on design *per se,* but on the *kind of design* we observe. As creationists point out, some kinds of design, such as snowflakes and wind-worn rock formations, *do* result from time and chance — *given* the properties of the materials involved. Even complex relationships, such as the oxygen-carbon dioxide balance in a sealed aquarium, can result from organisms "doing what comes naturally," *given* the properties of living things. But just as clearly, other kinds of design, e.g., arrowheads and airplanes, are the direct result of creative design and organization giving

matter properties it doesn't have and can't develop on its own. What *we know* about the DNA-protein relationship suggests that living cells have the *created kind* of design. It's not so much the molecular complexity as it is the *transcendent simplicity*.

In the well-known *Scientific American* book, *Evolution,* Dickerson[9] seems to support my point (without meaning to, I'm sure). After describing the problems in producing the right kinds of molecules for living systems, he says that those droplets that by "sheer chance" contained the right molecules survived longer. He continues, "This is not life, but it is getting close to it. The missing ingredient is. . . ."

What will he say here? The "missing ingredient" is . . . one more protein? . . . a little more DNA? . . . an energy supply? . . . the right acid-base balance? No, he says: "The missing ingredient is an orderly mechanism. . . ." *An orderly mechanism!* That's what's missing — but that's what life is all about! As I stated before, life is not a property of substance; it's a property of organization. The same kind of reasoning applies to the pyramids in Egypt, for example. The pyramids are made of stone, but studying the stone does not even begin to explain how the pyramids were built. Similarly, until evolutionists begin to explain the origin of the "orderly mechanism," they have not even *begun* to talk about the origin of life.

When it comes to the evolutionary origin of that orderly mechanism, Dickerson adds, we have "no laboratory models; hence one can speculate endlessly, unfettered by inconvenient facts." With "no laboratory models" to provide data, the case for the *evolution* of life must be based on *imagination.* But, as Dickerson admits, "We [evolutionists] can only imagine what probably existed, and our imagination so far has not been very helpful."

The case for *creation,* however, is not based on imagination. Creation is based instead on *logical inference* from our *scientific observations,* and on simple acknowledgment that everyone,

scientists and laymen alike, recognize that certain kinds of order imply creation.

Let me give you another example of the same sort of reasoning. Imagine that you have just finished reading a fabulous novel. Wanting to read another book like it, you exclaim to a friend, "Wow! That was quite a book. I wonder where I can get a bottle of that ink?" Of course not! You wouldn't give the ink and paper credit for writing the book. You'd praise the author, and look for another book by the same writer. By some twist of logic, though, many who read the fabulous DNA script want to give credit to the "ink (DNA base code) and paper (proteins)" for composing the code.

In a novel, the ink and paper are merely the means the author uses to express his or her thoughts. In the genetic code, the DNA bases and proteins are merely the means God uses to express His thoughts. The real credit for the message in a novel goes to the author, not the ink and paper, and the real credit for the genetic message in DNA goes to the Author of life, the Creator, not to the creature (Rom. 1:25).

The message conveyed by DNA is the kind called "*specified complexity*" in contrast to randomness or "mere" order. It takes only a simple program or algorithm, for example, to generate a random sequence of letters: (1) Print any letter; (2) Repeat step 1. An ordered, repeat pattern, such as ABCABCABC, could be generated by an algorithm nearly as simple: (1) Print ABC; (2) Repeat step 1. A program ENORMOUSLY larger and more sophisticated would be required to specify, for example, the letter sequence in the first volume of an encyclopedia set! The letter sequence is complex and specific ("specified complexity"), like the base letter sequence in human DNA — except that the DNA contains more information than a thousand volumes of literary works![10]

Occasionally, naïve evolutionists argue that crystal formation demonstrates that order can appear spontaneously, without "supernatural" help. *Crystal order, yes; specified complexity, no.* A

crystal is a beautiful but simple repeat pattern produced by the shape and charge of its constituents. At 32°F (O°C), for example, the areas of partial plus and minus charges on water molecules attract them with a force greater than the thermal motion that keeps them apart at higher temperatures. The exquisite shape of the ice crystal is an automatic consequence of the shape and charge distribution ("design features") of the water molecules. (Incidentally, ice crystal formation is driven by decreasing electrostatic potential, an illustration — not a contradiction — of the famed second law of thermodynamics.)

The "specified complexity" in a DNA sequence is nothing like the "ordered simplicity" or repeat pattern in the ice crystal. Breaking a big ice crystal produces little ice crystals, each with structures and properties like the original. Breaking a DNA chain produces fragments that are dissimilar in structure and lose their function entirely. A child at home can make ice crystals; it takes a team of chemists using expensive equipment to produce a specific DNA sequence from scratch.

The *specified complexity* in a DNA gene sequence has very *high information content*. Scientists know two things about information. First, information is independent of the material that carries it. The phrase "In God We Trust" can be written in pen or pencil, typed onto paper or a computer screen, embroidered in lace, etched in stone, impressed on American coins, etc. The message is the same in any case, and it is obviously not produced by the material that conveys it. In other words, informational messages — including genetic messages — have the "exherent" kind of design, reflecting plan, purpose, and special acts of creation. Thus, the *meaning of a message lies with its Creator, not its carrier*.

Second, information comes only from pre-existing information. Much more information on information can be found in the landmark[11] book by internationally respected information theorist Werner Gitt, *In the Beginning Was Information*. Biblically, that concept is expressed as "In the beginning, God . . ."

(Gen. 1:1) and as "In the beginning was the Word" (John 1:1). The word "Word," identified as Jesus Christ in John 1:14, is the Greek word "*Logos*." Logos is a grand word in Greek, connoting divine plan, reason for being, etc., and means "study of" as the suffix "ology" attached to the various academic disciplines. Wow! Our DNA ties us back to the ultimate source of meaning and purpose for the whole universe!

Creation thus stands between the classic extremes of mechanism and vitalism. Mechanists, including evolutionists, believe that both the *operation* and *origin* of living things are the result of the laws of chemistry which reflect the inherent properties of matter. Vitalists believe that both the operation and origin of living systems depend on mysterious forces that lie beyond scientific description. According to creation, living things, including their DNA codes, *operate* in understandable ways that can be described in terms of scientific laws, but such observations include properties of organization that logically imply a created origin of life.

In this sense, the Bible proved to be, as it often has, far ahead of its time. Into the 1800s, most scientists and philosophers believed living things were made of something fundamentally different from non-living. Genesis 1–2 tells us living things, human beings included, were just made of "dust of the ground." Indeed, scientists now recognize that living cells are composed of only a few simple elements. It's not the stuff ("dust") we're made of that makes us special; it's the *way* we're put together. It's not the metal and glass that make an airplane fly, nor the ink and paper that write a novel. Similarly, it's not the "dust" that makes life, but the way it's put together with creative design and organization. When that organization is lost, we return to "dust," the simple elements that we are made of, just as other created objects break down into their simpler parts when left to the ravages of time, chance, and chemistry.

The creationist, then, recognizes the orderliness that the vitalist doesn't see, but he doesn't limit himself to only those kinds of

order that result from time, chance, and the properties of matter, as the evolutionist does. Creation introduces levels of order and organization that greatly enrich the range of explorable hypotheses and turn the study of life into a *scientist's delight.* Science requires an orderliness in nature. One of the real emotional thrills of my changing from evolution to creation was realizing both that there are many more levels of order than I had once imagined and that order in nature, and a mind in tune with it, were guaranteed by God himself. It's no wonder that explicit biblical faith gave initial success to the founding fathers of modern experimental science (a couple of centuries before evolution came along to shift the basis toward time and chance).

If the evidence for the creation of life is as clear as I say it is, then other scientists, even those who are evolutionists, ought to see it — and they do.

I once took my students to hear Francis Crick, who shared a Nobel Prize for the discovery of DNA's structure. After explaining why life could not and did not evolve on earth, he argued instead for "directed panspermia," his belief that life reached earth in a rocket fired by intelligent life on some other planet. Crick admitted that his view only moved the creation-evolution question back to another time and place, but he argued that different conditions (which he did *not* specifiy) might have given life a chance to evolve that it did not have on earth.[12]

Creationists are pleased that Crick recognized the same fatal flaws in chemical evolution that they have cited for years, but creationists also point out that the differences between "chemical chemistry" and "biological chemistry" are wrapped up with the fundamental nature of matter and energy and would apply on other planets as well as on earth. [13]

That opinion seems to be shared in part by famed astronomer Sir Fred Hoyle,[14] who made the news under the heading: "There *must* be a God." Hoyle and his colleague, Chandra Wickramasinghe, independently reached that conclusion after

their mathematical analyses showed that believing that life could result from time, chance, and the properties of matter was like believing that "a tornado sweeping through a junkyard might assemble a Boeing 747 from the materials therein."

Drawing the logical inference from our scientific knowledge, both scientists concluded that "it becomes sensible to think that the favorable properties of physics on which life depends are in every respect *deliberate"* (emphasis Hoyle's). Both were surprised by their results. Hoyle called himself an agnostic, and, in the same article, Wickramasinghe said he was an atheistic Buddhist who "was very strongly brainwashed to believe that science cannot be consistent with any kind of deliberate creation."

My purpose in quoting these scientists (and others later on) is not, of course, to suggest that they are creationists who would endorse all my views.[15] Rather, it is simply to show that experts in the field, even when they have no preference for creationist thinking, at least agree with the creationists on the facts, and when people with different viewpoints agree, we can be pretty sure what the facts are. I also want to show that scientists who are not creationists are able to see that creation is a legitimate scientific concept, whose merits deserve to be compared with those of evolution.

In that light, I'd like to call your attention to a fascinating and revolutionary book, *Evolution: A Theory in Crisis,* by a prominent molecular biologist, Dr. Michael Denton.[16] In a television program we did together, and in our extensive personal conversations, Dr. Denton describes himself as a child of the secular age who desires naturalistic explanations when he can find them. When it comes to the origin of life, Dr. Denton explains with authority and stark clarity that evolutionists are nowhere near a *naturalistic* explanation at present. After comparing the genetic programs in living things to a library of a thousand volumes encoding a billion bits of information and all the mathematically intricate algorithms for coordinating them, Dr. Denton refers to

the chemical evolution scenario as "simply an affront to reason," i.e., an insult to the intelligence! (p. 351).

He openly and frankly states that the thesis of his book is "anti-evolutionary" (p. 353), but it seems to me that he is cautiously taking a step even further. The first chapter of his book is titled "Genesis Rejected," and he would react very strongly against being called a creationist, but in his honest analysis of the creation-evolution controversy through history, Dr. Denton freely admits that many of the scientific views of the early creationists have been vindicated by modern discoveries in science.

Take William Paley's classic argument that design in living things implies a Designer just as clearly as design in a watch implies a watchmaker. In *The Blind Watchmaker,*[17] discussed later, Richard Dawkins argues — incorrectly — that Paley was wrong. Denton states, "Paley was not only *right* in asserting an analogy between life and a machine, but also *remarkably prophetic* in guessing that the technological ingenuity realized in living systems is vastly in excess of anything yet accomplished by man" (emphasis added). Then Denton goes on to summarize his thinking on life's origin (p. 341) as follows:

> The almost irresistible force of the analogy has completely undermined the complacent assumption, prevalent in biological circles over most of the past century, that the design hypothesis can be excluded on the grounds that the notion is fundamentally a metaphysical *a priori* concept and therefore scientifically unsound. *On the contrary, the inference to design is a purely* a posteriori *induction based on a ruthlessly consistent application of the logic of analogy.* The conclusion may have religious implications, but *it does not depend on religious presuppositions* (emphasis added).

Now that's quite an admission! Even though he would deny any leaning toward a Christian concept of creation, this leading

molecular biologist sees quite plainly that a scientific concept of creation can be constructed, just as I've said, using the ordinary tools of science, logic, and observation. In fact, Denton intimates that creation scientists have shown more respect than evolutionists for empirical evidence and a "ruthlessly consistent" application of logic!

It's also true, as Denton concludes, that creation may have religious implications, but so does evolution, and that should not prevent our evaluating their scientific merits on the basis of logic and observation alone.

In a short but thought-provoking article, British physicist H.S. Lipson[18] reached the same conclusion. First he expressed his interest in life's origin, then his feeling — quite apart from any preference for creation — that, "In fact, evolution became in a sense a scientific religion; almost all scientists have accepted it and many are prepared to 'bend' their observations to fit with it."

After wondering how well evolution has stood up to scientific testing, Lipson continues: "To my mind, the theory [evolution] does not stand up at all." Then he comes to the heart of the issue: "If living matter is not, then, caused by the interplay of atoms, natural forces, and radiation [i.e., time, chance, and chemistry], how has it come into being?" After dismissing a sort of directed evolution, Lipson concludes: "I think, however, that we must go further than this and admit that the only acceptable explanation is *creation"* (emphasis his).

Like Hoyle and Wickramasinghe, Lipson is a bit surprised and unhappy with his own conclusion. He writes, "I know that this [creation] is anathema to physicists, as indeed it is to me." But his sense of honesty and scientific integrity forces him to conclude his sentence thus: ". . . but we must not reject a theory that we do not like if the experimental evidence supports it."

By the way, let me assure you that not *all* who see the evidence of creation are unhappy about it! Witness Dr. Dean Kenyon. Dr. Kenyon is a molecular biologist whose area of research interest is

specifically the origin of life. His book on life's origin, *Biochemical Predestination,* opened with praises for Darwinian evolution, and he taught evolution at San Francisco State University for many years.

A couple of students in Dr. Kenyon's class once asked him to read a book by Dr. Duane Gish on creation science. He didn't want to, but thanks to their polite persistence (1 Pet. 3:15), he resolved to read it and refute it, but, as I heard him tell it, he read it and *couldn't* refute it. Instead, Dr. Kenyon got interested in creation science and began a long re-evaluation of the scientific evidence, which finally led him to the *happy* conclusion that life, including his, is here as a result of creation, the deliberate plan and purpose of a personal Creator God![19]

Comparative Similarities: Homology

If God made people as people, why are we full of "animal parts"? Look at your arm for a moment and try to picture the bones inside. There's one bone attached to the body, two bones in the forearm, a little group of wrist bones, and bones that extend out into the fingers. As it turns out, there are many other living things that have forelimbs with a similar pattern: the foreleg of a horse or dog, the wing of a bat, and the flipper of a penguin, for example, as shown in Figure 6. Biologists use the term "homology" for such similarities in basic structure.

Why should there be that kind of similarity? Why should a person's arm have the same kind of bone pattern as the leg of a dog and the wing of a bat? There are two basic ideas. One of these is the evolutionary idea of *descent from a common ancestor.* That idea seems to make sense, since that's the way we explain such similarities as brothers and sisters looking more alike than cousins do. They have parents closer in common.

Using descent from a common ancestor to explain similarities is probably the most logical and appealing idea that evolutionists have. Some think that our ability to classify plants and animals on a groups-within-groups hierarchical basis virtually forces

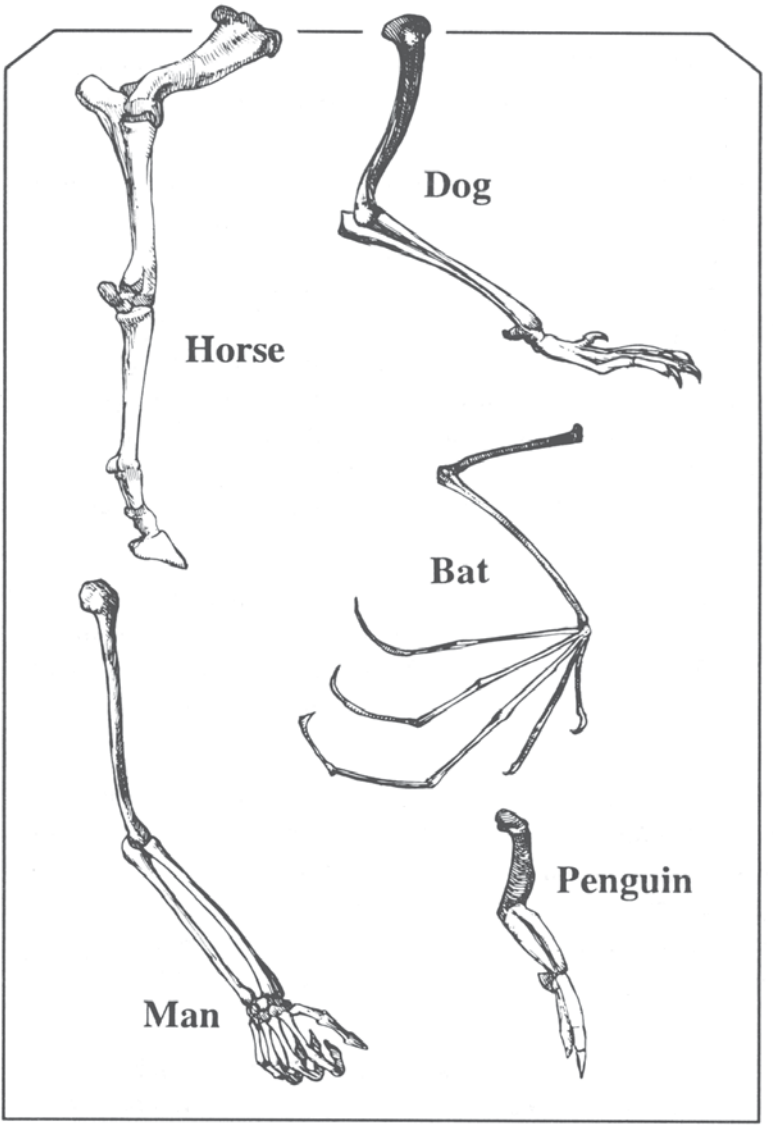


Figure 6. Bones in the human arm, the forelimbs of horses and dogs, a bat's wing, and a penguin's flipper all share a similarity in basic structural pattern called *homology*. What does this similarity (homology) mean: descent from a *common ancestor* (evolution), or creation according to a *common plan* (creation)?

scientists to treat evolution as a "fact." However, we can classify kitchen utensils on a groups-within-groups basis, but that hardly forces anyone to believe that knives evolved into spoons, spoons into forks, or saucers into cups and plates.

After all, there's another reason in our common experience why things look alike. It's *creation according to a common plan.* That's why Fords and Chevrolets have more in common than Fords and sailboats. They share more design features in common.

What's the more logical inference from our observation of bone patterns and other examples of homology: descent from a common ancestor, or creation according to a common plan? In many cases, either explanation will work, and we can't really tell which is more reasonable. But there seems to be times when the only thing that works is creation according to a common design.

I get support for my claim again from Denton,[20] in his chapter titled "The Failure of Homology." Dr. Denton is not only a research scientist with a Ph.D. in molecular biology, but also an M.D. with an intimate knowledge of comparative anatomy and embryology. He admits his desire to find naturalistic explanations for patterns of similarity among organisms (homology), but he also admits the failure of evolutionary explanations.

Like every other scientist, Denton recognizes the striking similarity in bone pattern evident between vertebrate fore- and hindlimbs. Yet no evolutionist, he says, claims that the hindlimb evolved from the forelimb, or that hindlimbs and forelimbs evolved from a common source. I was once taught to refer to corresponding parts of the male and female reproductive systems as "sexual homology." Homology, in that case, could not possibly be explained by descent from a common ancestor; that would mean that males evolved from females, or vice versa, or that human beings evolved from some animal that had only one sex.

Worse yet for evolution, structures that appear homologous often develop under the control of genes that are *not* homologous. In such cases, the thesis that similar structures developed

from genes modified during evolutionary descent is precisely falsified.

In frogs, for example, the five digits on each limb grow out from buds on the embryonic paddle; in human embryos, the digits form as the tissue between them is resorbed. Here quite *different* gene-enzyme mechanisms produce *similar* (homologous) patterns. Structures in adult lobsters and crayfish are so similar (homologous) that the same lab instructions can be used for dissecting either, yet the crayfish egg develops directly into the adult form while the lobster egg reaches the homologous pattern through a free-swimming larval stage.

Our observation of similarity or homology is real enough, but that's true, Denton points out, "whether the causal mechanism was Darwinian, Lamarckian, vitalistic, *or even creationist*" (emphasis added). Although the evidence is not as spectacular and compelling as the biomolecular data, I would say the weight of our present knowledge of homology favors Denton's final alternative: creation according to a common design.

Perhaps the clearest anatomical evidence of creation is "convergence." The classic example is the similarity between the eyes of humans and vertebrates and the eyes of squids and octopuses. Evolutionists recognize the similarity between the eyes easily enough, but they've never been able to find or even imagine a common ancestor with traits that would explain these similarities. So, instead of calling these eyes homologous organs, they call them examples of "convergent evolution." Rather than evolution, however, we have *another* example of similarity in structure that cannot be explained as evolutionary descent from a common ancestor.

Convergence, in the sense of similar structures designed to meet similar needs, would be expected, of course, on the basis of creation according to a common design. As we'll see later, both the octopus eye and the vertebrate eye are complete, complex, and totally distinct from one another right from their

first appearance in the fossil sequence. Biologist Michael Land[21] sounds like a creationist when he mentions in passing that the vertebrate eye "shares design features but not evolution" with the eye of the cephalopod mollusks such as the octopus.

The real focus of Land's article, however, is "divergence," the occurrence of quite distinct structures in plants and animals that otherwise are supposed to be close evolutionary relatives. Certain shrimp-like animals that live in deep ocean darkness, he says, have compound eyes with lenses all arranged to focus light at a common point (rather than forming multiple images, as most compound eyes do). But, he continues, some members of the group have "lens cylinders" that smoothly bend the incoming light (because of smoothly varied refractive indices), whereas others have square facets with a "mirror system" for focus (utilizing even a double-corner bounce). Ingenious use of physics and geometry should be evidence enough of creation it seems to me — but there's more.

Comparing the mirrors with the lens cylinder system, Land says, "Both are successful and very sophisticated image-forming devices, but I cannot imagine an intermediate form [or common ancestral type] that would work at all." The kind of design in these eyes, he says, seems impossible to explain as a result of evolutionary relationship. So Land goes on to suggest that the shrimp-like animals with different systems should not be classified as evolutionary relatives, even though they are otherwise quite similar.

Even more interesting is Land's statement about how he felt when he was trying to figure out the mirror system. He said he was "trying not to come to the conclusion that these eyes had been put there by God to confuse scientists." They may confuse evolutionists, but may I suggest instead that these eyes were put there by God to *inform* scientists. As such cases show, a mind open to examples of created order can hasten and enrich the scientific search for understanding.

Some evolutionists admit they have failed to find good evidence of evolution in comparing large structures, so they are looking instead for homology among molecules. In a foundational book basically describing the three-dimensional structures first known for proteins, Dickerson and Geis[22] state that "from the perfection of protein sequence and structure analysis. . . . We can pin down with great precision the relationships between the species and how the proteins evolved." Then, with every example they give, they proceed to *disprove* that evolutionary prediction.

Consider hemoglobin, for example, the protein that carries oxygen in red blood cells. Dickerson says that hemoglobins pose "a puzzling problem. Hemoglobins occur sporadically among the invertebrate phyla [the animals without backbones] in no obvious pattern." That is, they don't occur in an evolutionary *branching* pattern. I would suggest that they *do* occur in a creationist *mosaic* or *modular* pattern, like bits of blue-colored stone in an artist's mosaic. We find hemoglobin in nearly all vertebrates, but we also find it in some annelids (the earthworm group), some echinoderms (the starfish group), some mollusks (the clam group), some arthropods (the insect group), and even in some bacteria! In all these cases, we find the same kind of molecule — complete and fully functional. As Dickerson observes, "It is hard to see a common line of descent snaking in so unsystematic a way through so many different phyla. . . ."

If evolution were true, we ought to be able to trace how hemoglobin evolved. But we can't. Could it be *repeated* evolution, the spontaneous appearance of hemoglobin in all these different groups independently, asks Dickerson? He answers that repeated evolution seemed plausible only as long as hemoglobin was considered just red stuff that held oxygen. It does *not* seem possible, he says, that the entire eight-helix folded pattern appeared repeatedly by time and chance. As far as creationists are concerned, hemoglobin occurs, complete and fully functional,

wherever it is appropriate in the Creator's plan, somewhat like a blue-colored tile in an artist's mosaic.

Mosaic refers here to a picture or mural formed of many little bits of colored stone. According to the **mosaic concept of kind,** God used several different genes or gene sets over and over again in different combinations and proportions to make a variety of life forms, somewhat like an artist might use several different kinds of colored stones over and over in different proportions and arrangements to make a variety of artistic designs. The different bits of stone in the artist's mosaic would correspond to the many different genes or gene sets in God's "mosaics," which are the various forms of living things.

According to this *mosaic* concept, also called *modular* or *matrix*, God used a basic plan in making living creatures, somewhat similar to the plan He used in making different non-living substances. All the countless chemical substances in the universe are made from different combinations and proportions of only about a hundred different elements, usually displayed in a "chemistry mosaic" called the periodic table. Each kind of chemical compound can be represented by a formula expressing the number, kind, and arrangement of elements within it.

Perhaps God used genes as "elements" in making the various kinds of life, so that conceivably each different kind of life could be represented by a *"formula"* representing the number, kind, and arrangement of different genes in its chromosomes. Such formulas would, of course, be much larger and much more complex than those for the most complicated chemical substances. Nevertheless, the mosaic concept does suggest that all the incredible variety and diversity of life forms we see about us may be constructed using only the information in a few thousand DNA segments, compared to about 100 chemical elements. Even more exciting, creationists might be able to use a mosaic pattern (or mathematical matrix) to predict the existence of unknown organisms and their features, like Mendeleev used his periodic

table to predict the existence and properties of elements before their discovery.

The mosaic, non-branching (non-evolutionary) pattern of trait distribution produces practical problems for the biologist. Algae are usually classified into major groups on the basis of their pigment (greens, reds, browns, goldens, etc.), for example. But then both their structural complexity (unicellular, colonial, multicellular) and type of sexuality (iso-, hetero-, or oo-gamy) must be re-evolved independently ("convergently") on different branches of the evolutionary tree based on color. If they are classified by level of structural complexity, then neither the color pattern nor type of sexuality can be traced back to one common ancestor. Similarly, the evolutionary tree based on type of sexuality contradicts the branching trees predicted by pigment and structural complexity.

While he was yet the internationally respected senior paleontologist at the British Museum, Colin Patterson[23] stunned the scientific world by calling evolution an "anti-theory" that generates "anti-knowledge" — a concept full of explanatory vocabulary that actually explains nothing and that even generates a false impression of what the facts are.

Patterson said that he finally awoke, after having been duped into taking evolutionism as revealed truth all his life, to find that evolutionary theory makes bad systematics (the science of classification). He then proceeded to examine the data as a creationist would, in simple recognition that creationists produce testable hypotheses, and that he could understand and explain what inferences creationists would draw from the data, without either agreeing or disagreeing with them. What a superb example of healthy scientific skepticism! Patterson was able to see the data regarding homology in their wholeness, and experience the unbridled freedom to wonder not only *how* but *whether* evolution occurred!

Some are hoping that DNA comparisons and gene sequencing ("molecular homology") can somehow salvage evolutionary

classification.[24] Is there anyone who hasn't heard that DNA comparison suggests something like 98 percent similarity between man and chimpanzee? The evidence so convinced one evolutionist debater that he told the audience if a chimp asked to take his daughter out on a date, he was not sure he could say "No." (I hope the daughter would be allowed to say "No.") There are even some groups pushing for the extension of U.N. human rights protection to chimps and orangutans!

It only takes a trip to the zoo, of course, to convince us that man and ape share many features, and there are unseen similarities in bone, muscle, nerve and sense organs, circulatory and digestive systems, hair, milk, etc. It should be equally obvious, however, that creatures designed by the same Creator to move, eat, breathe, etc. in similar ways would have many molecular similarities in common.

An article on "The 2% Difference" (*Discover*, April 2006) praises evolution and puts down intelligent design, but the author (Sapolsky) actually admits and describes key evidences noted by creation scientists over the past two decades.[25] "Regulation is everything," he says. A sidewalk, fence, patio, and house may be made of bricks that are 100 percent identical, for example, but they are arranged in different ways to serve dramatically different purposes. Sapolsky points out that the brains of man and chimp operate using "the same basic building blocks" while they achieve "vastly different outcomes," so that in his opinion "there's not the tiniest bit of scientific evidence that chimps have aesthetics, spirituality, or a capacity for irony or poignancy." These awesome gaps or "qualitative distinctions" between the brains of chimps and people Sapolsky credits to a "relatively few" genes that regulate the number of brain cells (neurons) produced. Sapolsky seems to forget, of course, that a dysfunctional or diseased brain has just as many neurons as the ones we call normal, and stuffing more chips into a computer does not automatically improve it. It's not just the number of

parts that produce the great gulf between human and chimp; it's how the parts are connected. As creation scientists have long noted, and the Bible implies, living things (and their functioning parts) are not a product of substance, but of organization. At the atomic level ("dust of the ground"), all organisms are essentially 100 percent identical; if the 2 percent difference in DNA presumed for man and chimp told the other 98 percent how to organize, the differences would be at least as vast and unbridgeable as we observe.

And there's more. The April 2006 *Discover* article finally admitted what creation scientists have stressed for over 20 years: "a tiny 2% difference translates into tens of millions of AGCT differences." Indeed, a 2 percent difference among three billion base pairs would mean about *60 million* code letter differences between man and chimp. So, as creationists pointed out long ago and Sapolsky admits, "There are likely to be nucleotide differences in every single gene." In fact, reported in 2004 studies comparing chimp chromosome 22 with its presumed counterpart on human chromosome 21 showed a DNA difference of about 1.5 percent resulted in differences of more than 80 percent among the proteins produced by those genes.[26] That did not surprise creation scientists, but shocked evolutionists.

Actually, studies of molecular homology have produced major controversies within the evolutionists' camp, since DNA trees frequently disagree with evolutionary trees based on fossils and/or on comparative anatomy. The evolutionist split is greatest when it comes to conflicting attempts (based on dubious, compounded assumptions) to use molecular homology as some sort of "evolutionary clock." After documenting the misfit of molecular data with both of two competing evolutionary views, Michael Denton[27] writes this summary (p. 306):

> The difficulties associated with attempting to explain how a family of homologous proteins could have evolved at constant rates has created chaos in evolutionary

> thought. *The evolutionary community has divided into two camps — those* still adhering to the *selectionist* position, and those rejecting it in favor of the *neutralist.* The devastating aspect of this controversy is that neither side can adequately account for the constancy of the rate of molecular evolution; yet *each side fatally weakens the other.* The selectionists wound the neutralists' position by pointing to the disparity in the rates of mutation per unit time, while the neutralists destroy the selectionists' position by showing how ludicrous it is to believe that selection would have caused equal rates of divergence in "junk" proteins or along phylogenetic lines so dissimilar as those of man and carp. Both sides win valid points, but in the process the credibility of the molecular clock hypothesis is severely strained and with it the *whole paradigm of evolution itself is endangered* (emphasis added).

Denton doesn't stop with these devastating anti-evolutionary comments (and a comparison of belief in molecular clocks with belief in medieval astrology!). He also describes data from molecular homology as a "biochemical echo of typology," where typology is the pre-evolutionary view of classification developed by scientists on the basis of creationist thinking.

Although partial data fit too easily into conflicting branching patterns, comparative similarities and homologies don't fit well at all onto evolutionary trees. They fit instead into hierarchical (groups within groups) categories, perhaps suggesting a multidimensional matrix (a "cube of cubes" in more than three dimensions). When Mendeleev discovered the pattern God used in creating the chemical elements, he was able to predict the existence and properties of elements not then known to science. Creationists may one day discover predictive patterns of trait distribution among living things, and prediction is the real measure of merit among scientific theories.

Embryonic Development

Some see the birth of a child as the most personal expression of God's creativity, but evolutionists say, "Look, if you're talking about creation, then surely the Creator must not be very good at it, or else there wouldn't be all those mistakes in human embryonic development."

Figure 7 shows an early stage in human development. Consider it your first "baby picture." You start off as a little round ball of unformed substance. Then gradually arms, legs, eyes, and all your other parts appear. At one month, you're not quite as charming as you're going to be, and here's where the evolutionist says, "There's no evidence of creation in the human embryo. Otherwise, why would a human being have a yolk sac like a chicken, a tail like a monkey, and gill slits like a fish? An intelligent Creator should have known that human beings don't need those things."

Well, there they are, "gill slits, yolk sac, and a tail." Why are they there? What's a creationist going to say? The evolutionist believes these structures are there only as useless leftovers or "vestiges" of our evolutionary ancestry, reminders of the times when our ancestors were only fish, reptiles, and apes.

The concept of vestigial organs even resulted in cases of "evolutionary medical malpractice." Young children once had their healthy (and helpful, disease-fighting) tonsils removed because of the widespread belief that they were only useless vestiges. That idea actually slowed down scientific research for many years. If you believe something is a useless, non-functional leftover of evolution, then you don't bother to find out what it *does.* Fortunately, other scientists didn't take that view. Sure enough, studies have shown that essentially all 180 organs once listed as evolutionary vestiges have significant functions in human beings.

Take the yolk sac, for instance. In chickens, the yolk contains much of the food that the chick depends on for growth. But we, on the other hand, grow attached to our mothers, and they

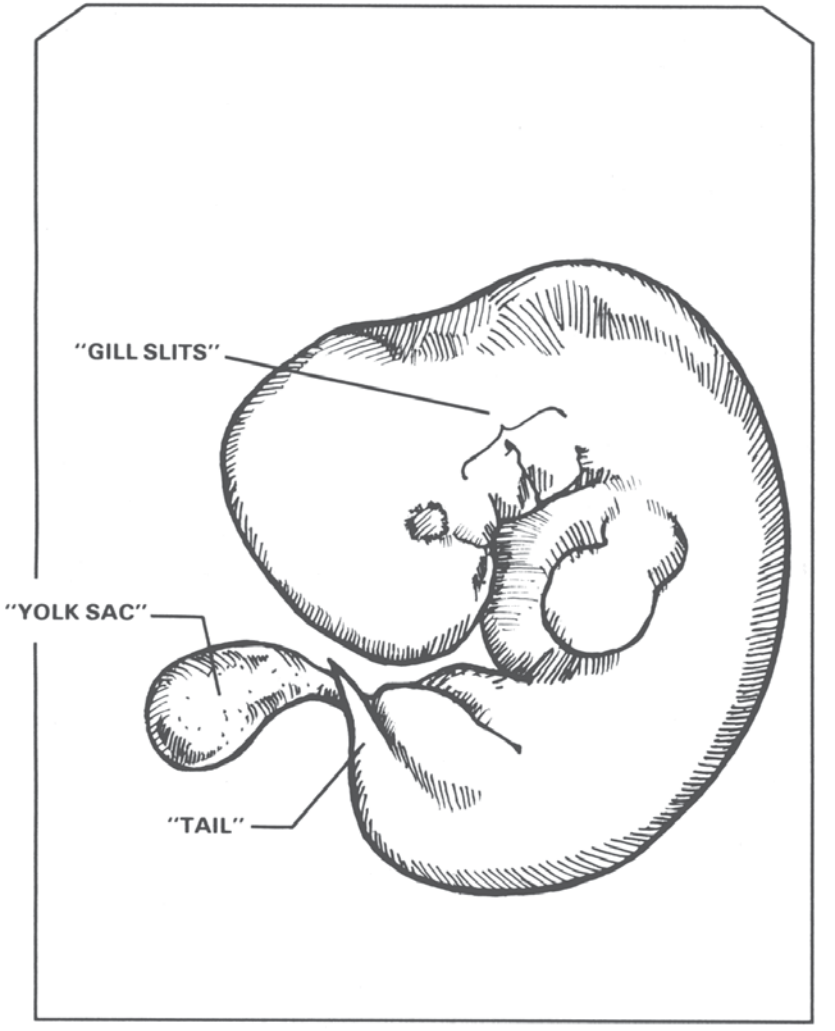


Figure 7. The marvelous development of the human embryo should make everyone a creationist, it seems to me, but evolutionists say that the so-called "gill slits, yolk sac, and tail" are useless evolutionary leftovers (vestiges) that virtually "prove" we evolved from fish, reptiles, and apes. How does a creationist respond?

nourish us. Does that mean the yolk sac can be cut off from the human embryo because it isn't needed? Not at all. The so-called "yolk sac" is the source of the human embryo's first blood cells, and death would result without it!

Now here's an engineering problem for you. In the adult, you want to have the blood cells formed inside the bone marrow. That makes good sense, because the blood cells are very sensitive to radiation damage, and bone would offer them some protection. You need blood in order to form the bone marrow that *later on* is going to form blood. So, where do you get the blood first? Why not use a structure similar to the yolk sac in chickens? The DNA and protein for making it are "common stock" building materials. Since it lies conveniently outside the embryo, it can easily be discarded after it has served its temporary — but vital — function.

Notice, this is exactly what we would expect as evidence of good creative design and engineering practice. Suppose you were in the bridge-building business, and you were interviewing a couple of engineers to determine whom you wanted to hire. One person says, "Each bridge I build will be entirely different from all others." Proudly he tells you, "Each bridge will be made using different materials and different processes so that no one will ever be able to see any similarity among the bridges I build." How does that sound?

Now the next person comes in and says, "Well, in your yard I saw a supply of I-beams and various sizes of heavy bolts and cables. We can use those to span either a river or the San Francisco Bay. I can adapt the same parts and processes to meet a wide variety of needs. You'll be able to see a theme and a variation in my bridge building, and others can see the stamp of authorship in our work." Which would you hire?

As A.E. Wilder-Smith[28] pointed out long ago, we normally recognize in human engineers the principles of creative economy and variations on a theme. That's what we see in human embryonic

development. The same kind of structure that can provide food and blood cells to a chicken embryo can be used to supply blood cells (all that's needed) for a human embryo. Rather than reflecting time and chance, adapting similar structures to a variety of needs seems to reflect good principles of creative design.

The same is true of the so-called "gill slits." In the human embryo at one month, there are wrinkles in the skin where the "throat pouches" grow out. Once in a while, one of these pouches will break through, and a child will be born with a small hole in the neck. That's when we find out for sure that these structures are *not* gill slits. If the opening were really part of a gill, if it really were a "throwback to the fish stage," then there would be blood vessels all around it, as if it were going to absorb oxygen from water as a gill does. But there is no such structure in humans of any age. We simply don't have the DNA instructions for forming gills.

Unfortunately, some babies are born with three eyes or one eye. That doesn't mean, of course, that we evolved from something with one eye or three eyes. It's simply a mistake in the normal program for human development, and it emphasizes how perfect our design features and operation must be for normal life to continue.

The throat (or pharyngeal) grooves and pouches, *falsely* called "gill slits," are *not* mistakes in human development. They develop into absolutely essential parts of human anatomy. The first pouches form the palatine tonsils that help fight disease. The middle ear canals come from the second pouches, and the parathyroid and thymus glands come from the third and fourth. The thymus prepares T cells, the immune cells destroyed by the AIDS virus, so you know how important the thymus is for human life. Without the parathyroids, we would be unable to regulate calcium balance and could not even survive. Another pouch, thought to be vestigial by evolutionists until just recently, becomes a gland that assists in calcium balance. Far from being useless evolutionary vestiges, then, these so-called "gill slits" (pharyngeal pouches) are quite essential for distinctively human development.

As with "yolk sac," "gill slit" formation represents an ingenious and adaptable solution to a difficult engineering problem. How can a small, round egg cell be turned into an animal or human being with a digestive tube and various organs inside a body cavity? The answer is to have the little ball (or flat sheet in some organisms) "swallow itself," forming a tube which then "buds off" other tubes and pouches. The anterior pituitary, lungs, urinary bladder, and parts of the liver and pancreas develop in this way. In fish, gills develop from such processes, and in human beings, the ear canals, parathyroid, and thymus glands develop. Following DNA instructions in their respective egg cells, fish and human beings each use a similar process to develop their distinctive features (see Figure 8).

What about the "tail"? Some of you have heard that man has a "tail bone" (also called the sacrum and coccyx), and that the only reason we have it is to remind us that our ancestors had tails. You can test this idea yourself, although I don't recommend it. If you think the "tail bone" is useless, fall down the stairs and land on it. (Some of you may have actually done that — unintentionally, I'm sure!) What happens? You can't stand up; you can't sit down; you can't lie down; you can't roll over. You can hardly move without pain. In one sense, the sacrum and coccyx are among the most important bones in the whole body. They form a crucial point of muscle attachment required for our distinctive upright posture (and also for defecation, but I'll say no more about that).

So again, far from being a useless evolutionary leftover, the "tail bone" is quite important in human development. True, the end of the spine sticks out noticeably in a one-month embryo, but that's because muscles and limbs don't develop until stimulated by the spine (Figure 8). As the legs develop, they surround and envelop the "tail bone," and it ends up inside the body.

Once in a great while there are reports of a child born with a "tail." Since the parents were quite pleased, one such child born recently in India was featured prominently on TV news in 2005.

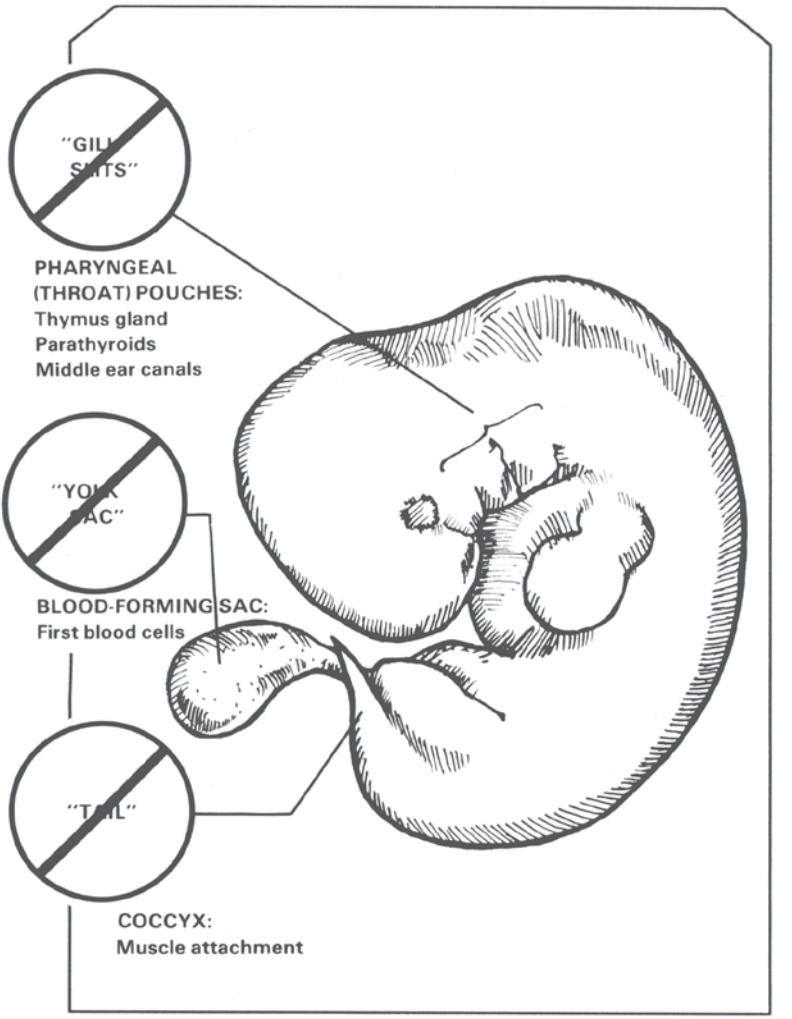


Figure 8. Far from being "useless evolutionary leftovers," the misnamed structures above are absolutely essential for normal human development. Similar structures are used for different functions in other embryos — and we normally consider variation on a theme and multiple uses for a part as evidence of good creative design.

But was it really a tail? No, it's just a bit of skin and fat that tells us, not about evolution, but about how our nervous systems develop. The nervous system starts stretched out open on the back. During development, it rises up in ridges and rolls shut. It starts to "zipper" shut in the middle first, then it zippers toward either end. Sometimes it doesn't go far enough down, and that produces a serious defect called *spina bifida*. Sometimes it rolls a little too far. Then the baby will be born, *not* with a tail, but with a fatty tumor. It's just skin and a little fatty tissue, so the doctor can just cut it off. It's not at all like the tail of a cat, dog, or monkey that has muscle, bones, and nerve, so cutting it off is not complicated. (So far as I know, no one claims that proves we evolved from an animal with a fatty tumor at the end of its spine.)

Unfortunately, evolution has such a hold on our thinking that doctors hate to tell a mother if she has a baby with a "tail." They can imagine the dismay: "Oh no; I've given birth to a throwback to the monkey stage in evolution!" Then the arguments begin: "It's your side of the family." "No, it's your side!" Fortunately, the extra skin and fat is not a tail at all. The details of human development are truly amazing. We really ought to stop, take a good look at each other, and congratulate each other that we turned out as well as we did!

There is an extremely rare but more serious defect in developmental regulation that can produce a "caudal appendage" with some muscle, nerve, blood, and cartilage or bone tissue. Defects in other embryonic regulator genes can result in too many or too few parts, failure of growth or of resorption, parts growing together that should remain separate, or parts remaining separate that should grow together, etc. *Hox gene errors* in insects can result in legs growing where antennae should be, and in flies with an extra but functionless set of wings. Such defects tell us nothing about evolutionary ancestry, but a lot about how normal development requires extreme precision in activating the right genes in the right places at the right times for the right duration.

There are a few famous cases of human beings with hair over most of their bodies (hypertrichosis universalis). Normal human beings have hair, of course, so *all* nucleated cells in the human body have the DNA instructions for producing hair. Regulators that turn genes on and off, therefore, may result in more or less hair than the normal amount in the usual places, but such people just have "people genes" and are NOT "throwbacks" to the supposed "ape stage" in evolution!

Evolutionists once said that human embryonic development retraced stages in our supposed evolutionary history. That idea, the now-defunct "biogenetic law," was summarized in the pithy phrase, "ontogeny recapitulates phylogeny." (Want to sound educated? Just memorize that phrase!) The phrase means that the development of the embryo is supposed to retrace the evolution of its group. Dr. Down named a syndrome "Mongoloid idiocy" because he thought it represented a "throwback" to the "Mongolian stage" in human evolution.

The "throwback concept" was based on faked diagrams that brought modest disgrace to "Germany's Darwin," Ernst Haeckel, in the 1860s.[29] Yet the embryo diagrams falsified to support evolution over 140 years ago were still in the 2005 lab manual used in a state college biology class where I spoke in 2006.

After a university talk on creation in which I didn't mention the embryo, a student asked, "If God created us, why do human embryos have a yolk sac, gill slits, and tail?" Before I could say anything, a local professor scolded emphatically: "Sit down! Hush. We don't believe that anymore!" In a debate at the University of New Brunswick, my opponent actually complimented what I had to say about the human embryo, stressing that the "throwback theory" (based on fudged diagrams!) had been disproved decades ago and desperately needed to be removed from textbooks.

It was even once believed that the fertilized egg represented our one-celled ancestors, sort of the "amoeba stage." Sure enough, we start as small, round single cells, but notice how superficial that

argument is. The evolutionists were just looking at the outside appearance of the egg cell. If we look just on the *outside appearance,* then maybe we're related to a marble, a BB pellet, or a ball bearing — they're small, round things! An evolutionist (or anyone else) would respond, of course, "That's crazy. Those things are totally different on the *inside* from a human egg cell." That's exactly the point. If you take a look on the inside, the "dot" we each start from is totally different from the first cell of every other kind of life. A mouse, an elephant, and a human being are identical in size and shape at the moment of conception. Yet in terms of DNA and protein, right at conception each of these types of life is as totally different chemically as each will ever be structurally. Even by mistake, a human being can't produce gills or a tail, because we just don't have and never had those DNA instructions.

The human egg cell, furthermore, is not just human, but also a unique individual. Eye color, general body size, and perhaps even temperament are already present in DNA, ready to come to visible expression. *The baby before birth is not even a part of his or her mother's body.* From conception onward, we may have genes for a blood type or hair color different from that of our mother. We may be a sex different from that of our mother — about half of us are. Our uniqueness begins at conception, and blossoms continuously throughout life.

Embryonic development is not even analogous to evolution, which is meant to indicate a progressive increase in potential. The right Greek word instead would be *entelechy,* which means an unfolding of potential present right from the beginning. That's the kind of development that so clearly requires creative design. That's why evolutionists don't use the change from tadpole to frog as an example of evolution. Unlike the *supposed* evolution of fish to frog, all the genes necessary to change a tadpole into a frog are present right from the very beginning.

Again, the Bible proves to be far ahead of its time. Scientists once thought (and some claimed they saw) tiny, pre-formed people

in either egg or sperm cells. But 3,000 years ago, the Psalmist David talked about how God beheld his "unformed substance" in the womb, and how he was "knit together," step by step, according to God's plan. His response in Psalm 139 should be ours: "I will praise You, for I am fearfully and wonderfully made."

Adaptation and Ecology: The Marvelous Fit of Organisms to Their Environments

We've looked now at molecules, bone patterns, and embryonic development, but the clearest and simplest evidence of creation is "the marvelous fit of living things to their environment." In the *Scientific American* book *Evolution,* Harvard evolutionist Richard Lewontin[30] says that "the marvelous fit of organisms to their environment . . . was [and I say is] the chief evidence of a Supreme Designer." In fact, Lewontin says that organisms "appear to have been carefully and artfully designed." Lewontin himself sees it only as a tough case to be solved by evolutionary theory, but other scientists might logically infer from their observations that living things *were* "carefully and artfully designed."

There are literally thousands of examples of the unique adaptations that suit each type of organism for its special role in the web of life (Figure 9). The fantastic features of structure, function, and behavior that make the honeybee so wondrous, for example, are familiar to almost anyone. But then there's cleaning symbiosis; the explosive chemical defense system of the bombardier beetle; the navigational skills of migrating reptiles, birds, fish, and mammals, etc. Jobe Martin continues the list in a captivating series of videos called "Incredible Creatures That Defy Evolution."[31]

Let me single out one example for now. Take the woodpecker, for instance.[32] Here's a bird that makes its living banging its head into trees. Whatever gave it the idea to do that in the first place? Was it frustration over losing the worm to the early bird? How did banging its head into trees increase its likelihood for survival — until *after* it had accumulated (by chance?) a thick

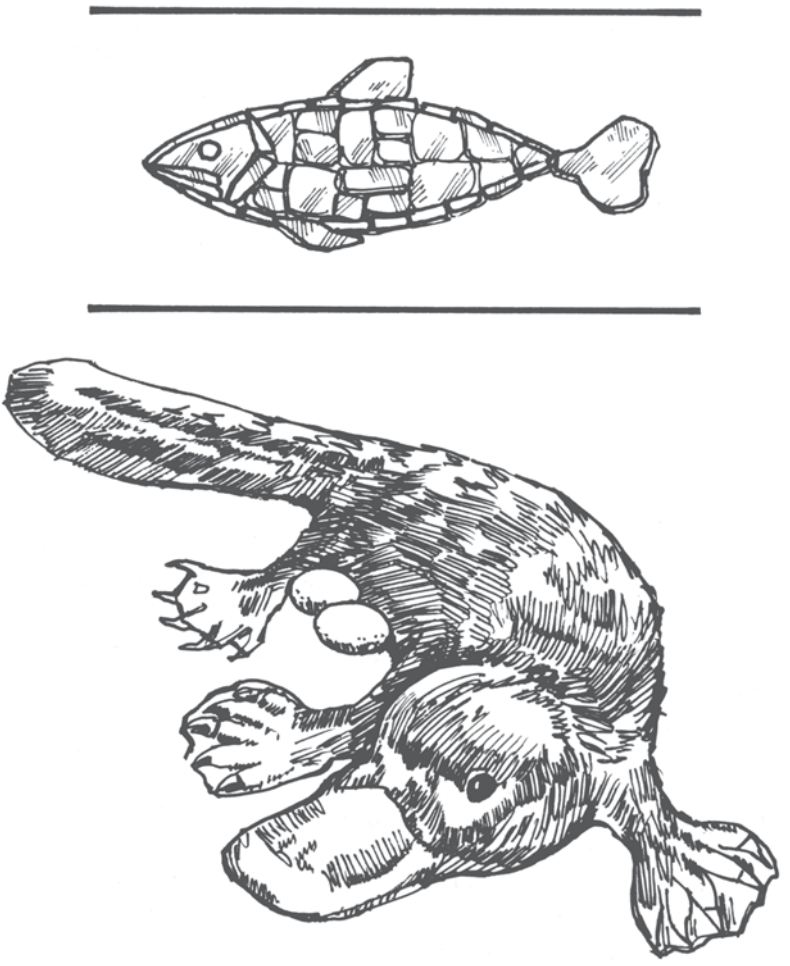


Figure 9. As evolutionist Lewontin acknowledges, living things "appear to have been carefully and artfully designed." Each type possesses various features complete and well fitted into the whole, like the tiles in an artist's mosaic. Although other animals share such adaptations with the platypus as milk glands, a leathery egg, and electric-signal sensitivity, it seems to me that all these could be put together into a single fascinating, functioning whole only by plan, purpose, and special acts of creation.

skull with shock-absorbing tissues, muscles, etc.! What would be the survival value of all these features (and how could they build up in the population) until *after* the bird started banging its head into trees?

The woodpecker is a marvel of interdependent parts or "compound traits," now popularly called "irreducible complexity" — traits that depend on one another for *any* to have functional value. When a woodpecker slams its head into a tree, the deceleration experienced is many times gravity. The nerve and muscle coordination must produce a dead-on hit; a slip to one side or the other could virtually wrench the cover off the brain! The eyelids snap shut when the beak strikes its target. Some scientists say that's to keep wood chips out of the eyes; others say it's to keep the eyeballs from popping out of their sockets! Both may be right!

For such drilling, a woodpecker obviously needs a tough bill, heavy-duty skull, and shock-absorbing tissue between the two. But if the woodpecker were put together by time and chance, without any planning ahead, which part came first? Suppose, just by chance, a baby bird is born with a tough bill. It decides to try it out. WHACK! It throws its head into a tree. The bill is just fine, but it squishes in the front of its face. One dead bird, end of evolutionary story!

But maybe I got it backward. Maybe, just by chance, a baby bird was born with a heavy-duty skull. WHACK! It throws its head into a tree. This time its skull is okay, but its bill folds up like an accordion. There's no evolutionary future in that either!

In fact, neither the tough bill nor the heavy-duty skull would have any functional survival value until both occurred together — along with the shock-absorbing tissue, nerve and muscle coordination, etc.! That's no problem if the woodpecker were put together by plan, purpose, and a special act of creation. We expect drilling tools created by people to have interdependent parts that must all be completely assembled before the machine

works. That's just good sense, and good science. We would surely expect no less from the perfect devices created by God!

There's more. At least since death entered the world, some woodpeckers are doing more than just drilling holes to store acorns. They're looking for bark beetles. The beetles hear all this pounding, of course, so they just crawl further down their tunnels. Some types of woodpeckers that are looking for bark beetles need more than just drilling tools; they need long, sticky tongues.

But if a bird gets a long, sticky tongue just by chance, what's it going to do with it? Dangling out of the bill, the tongue gets bit or even stepped on. As the bird is flying over a twig, the tongue could wrap around the twig and hang the hapless "pre-woodpecker." The answer for the woodpecker is to slip its tongue attachment into a muscular sheath that wraps around the skull *under* the scalp and inserts into the nostril! That makes good sense (and good science) if you're planning ahead, but poses real problems if your faith is in time and chance, trial and error. (Except in video games, you don't get another trial if the error is fatal!)

Evolutionists believe (like I once did) that all adaptations begin with time and chance, that is, with random changes in DNA and hereditary traits called mutations. In evolutionary theory, those chance mutations that suit an organism better to its environment are preserved by the process called natural selection. But natural selection can't act until the favored traits arise by mutation, i.e., by time and chance.

Well, what about mutations? Mutations certainly do occur, and they are responsible for perhaps 5,000 hereditary defects in human beings alone. Could mutations and selection working together (time, chance, struggle, and death, TCSD) produce the coordinated set of structural and behavioral adaptations necessary to originate the woodpecker? Let's see what two well-known biologists have to say about that.

Early creationists were primarily Christians, and that was often used as an excuse for ignoring their scientific arguments.

When Michael Denton exposed *Evolution: A Theory in Crisis* to the secular community, a number of scientists got interested in design evidences divorced from deity, and the influential movement called *Intelligent Design*, or *ID,* was born.

Biochemist Michael Behe coined the term *irreducible complexity*, which has become the watchword for ID. Before it can function to catch mice, he illustrates, a mousetrap must have several parts working together (e.g., platform, spring, holding bar, hammer, catch). Its function is "irreducibly complex," i.e., it can't function at all with parts fewer than these. The same is true for many "molecular machines" within living cells, as Behe argues persuasively with multiple detailed examples in *Darwin's Black Box* (and as I tried to illustrate with the woodpecker above). The Darwinian concept of step-by-step evolution by mutation-selection requires *survival rewards* AT EACH STEP, and Darwin said his theory would be falsified by any example of adaptation that could not be built one step at a time. Behe falsifies Darwinian evolution many times over, but then continues on to present the scientific support for intelligent design on a secular basis.[33]

Here's a brilliant scientist whose observations of the living world force him to postulate at least an *impersonal creative force.* Here's a scientist who recognizes that intelligent design can be logically inferred from observations of certain kinds of order, even when he does not say who or what the creative agent is.

Garrett Hardin,[34] a noted biologist and textbook author, seems to go even further than this in an old, but timeless, *Scientific American* book on adaptations and ecology, *39 Steps to Biology.* The first section, titled "Fearfully and Wonderfully Made" (a phrase from Psalm 139), describes several marvels of adaptation often used as evidence of creation. In the second section, "Nature's Challenges to Evolutionary Theory," Hardin discusses other remarkable relationships which, he says, "are only a few of the unsolved puzzles facing biologists who are committed to the Darwinian [evolutionary] theory." Then he openly wonders, "Is

the [evolutionary] framework wrong?" That is, do our observations of the living world force us, at least for the present, to rule out evolution as an explanation for origins? (Figure 10).

Hardin doesn't stop there. He goes on to ask, "Was Paley right?" If you're like me, you never heard of William Paley, but Hardin explains. Paley was a thinker in the 18th century who argued that the kind of design we see in the living world points clearly to a Designer. Then the evolutionists came along in the 19th century and argued that they could explain design on the basis of time, chance, struggle, and death that did *not* require a Designer. Now, said Hardin in the 20th century, "Was Paley right" after all? Do the kinds of design features we see in living things point clearly to a Designer? Paley was not thinking of an "impersonal creative force"; he was thinking, instead, of a personal Creator God.

Hardin's conclusion? *"Think about it!"* (emphasis added).

Think About It!

"Think about it!" What a sane and yet sensational idea. What a rallying point for both creationists and evolutionists.

The Scopes trial showed it was foolish to teach only creation; is it any wiser to teach only evolution? A detailed doctoral study by Richard Bliss[35] demonstrated that students using a two-model (creation-evolution) approach to origins showed more improvement in inquiry skills than those using the now traditional evolution-only approach. (By the way, the two-model students learned evolution concepts better than those taught evolution only.) Furthermore, a two-model approach cannot be accused of indoctrination; can evolution only? Surely, the only way students can "think about it" is when they have access to *all* the relevant data and the true academic freedom to explore *both* models of origin.

As Garrett Hardin so perceptively observes, the challenge to evolution does not come simply from a few religious fanatics. The challenge to evolution comes from the study of nature itself: "Nature's Challenges to Evolutionary Theory," he calls it. Even

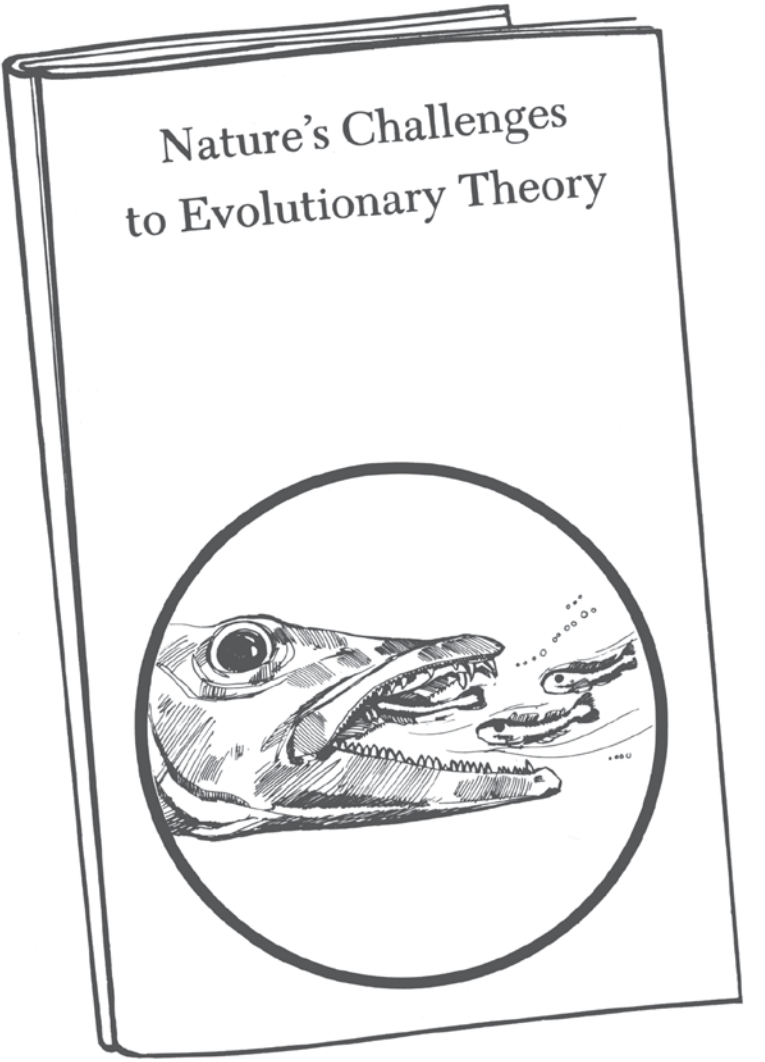


Figure 10. Marvels of adaptation are described under the heading "Nature's Challenges to Evolutionary Theory" in a *Scientific American* book edited by Garrett Hardin. Even though he's an evolutionist, Hardin asks, "Is the [evolutionary] framework wrong?" Then he goes on to ask, "Was Paley right?" when he said the kind of design we see in the living world requires a Designer. Then, in an expression of open-ended fairness that everyone can appreciate, Hardin concludes, "Think about it!" *Think about it.*

if various *pressure groups* (ironically operating under the guise of "academic freedom") succeed in *censoring* and *suppressing* all views except evolution, the case for creation will still be studied in science classes. The case for creation will be evident in sets of adaptations working together, such as we see in the woodpecker; in the growth and birth of a baby; and in the fantastic molecular integration within cells, such as the relationship between DNA and protein. Because of the way things have been made, the case for creation will always be present in the subject matter of science itself, especially in lab and field work.

We can differentiate the stone implements produced by human creative effort from those shaped by time, chance, and erosion. Similarly, we can distinguish created relationships among living things, such as those among the parts of a woodpecker, a growing baby, or a living cell.

One other special feature of creation is so obvious we often fail to notice it: its beauty. I once took my invertebrate zoology class to hear a lecture on marine life by a scientist who had just returned from a collecting trip to the Philippines. Toward the end of his lecture he described the brightly colored fish he had observed at a depth where all wavelengths of light were absorbed except for some blue. In their natural habitat, the fish could not even see their own bright colors, so what possible survival value could the genetic investment in this color have? Then he challenged the students to pose that question to their biology professors.

When my students asked me, I couldn't help thinking of Genesis 2:9, where God is described as creating plants both *"pleasant to the sight* and good for food." We normally expect to find aspects of beauty as well as usefulness in the artifacts of human creation; perhaps we should expect to find beauty in God's creation of life as well.

Remember, though, that I'm not trying to convince you of all these things in one short book. I used to teach evolution in university biology classes, and it took me several years to change my

thinking from evolution to creation. Let's face it, there is much to be said for evolution. In fact, I still present the case for evolution to my classes, then let them bombard me with questions which I answer as an evolutionist. That certainly surprises some of my students, but it stimulates all of them to "think about it."

That's my purpose in this book: to stimulate your thinking. The case is not all one-sided in favor of creation, but it's certainly not one-sided in favor of evolution either. When it comes to origins, we can't appeal to direct observation, nor can we run experiments on the past. We're stuck with *circumstantial evidence,* i.e., evidence subject to more than one interpretation. Our goal must be to weigh *all* the relevant evidence, asking ourselves which is the more logical inference from the weight, on balance, of our scientific observations.

The case for creation I've presented so far is based on what we *do know* and *can explain* in the areas of molecular biology, homology, embryology, and adaptation. But what about Darwinian natural selection and the fossil evidence? Well, let's dig in. All you need is an inquiring mind, a sharp eye, and a willing heart. "Think about it!" What's the more logical inference from our scientific observations of genetics and the fossil evidence: time, chance, and the evolution of matter, *or* plan, purpose, and irreducible properties of organization pointing to special acts of creation?

Endnotes

1. The 4 Cs of biblical history can be expanded to 7 Cs by introducing *confusion* for the confusion of languages at Babel and/or *chill* for the Ice Age. For a college brochure in 1989, I used *creation, corruption, catastrophe, chill, confusion, Christ,* and *coming again* as the 7 Cs. Answers in Genesis uses *creation, corruption, catastrophe, confusion, Christ, Cross*, and *consummation*.
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