CHAPTER 6. EVOLUTION

Genesis 1:11. And God said, let the earth bring forth vegetation, the herb yielding seed and the fruit tree yielding fruit after its kind, whose seed is in itself, upon the earth: and it was so.

Ever since Charles Darwin wrote *The Origin of the Species* in 1859 the scientific world and Christian church have been in conflict over the Theory of Evolution. This is the principle battlefield of science with Christianity because according to many Christians, the ideology of evolution has been responsible for naturalism, modernism, communism, secular humanism, and the breakdown of the family, among other societal woes. Even the word “evolution” can make some Christians fighting mad.

**Evolution: What Does This Word Mean?**

Because “evolution” can be used in basically three different ways, we must start our discussion by defining what is meant by the term.

**Evolution (General Sense).** The word evolution can be used in a general sense for any change or development over time. You could describe how stars evolve – that is, they change their size, explode, become novas or supernovas over time, etc. Or, you could be tracing the cultural evolution (change) of a people group. You could even say that the Bible has “evolved” (developed or unfolded) as God has revealed Himself to humankind over time. (This topic will be covered in Chapter 7). Used in this general sense, the term is not controversial, at least not to most Christians.

**Special Theory of Biological Evolution (Microevolution).** The Special Theory of Biological Evolution describes how small changes in biological populations occur over time, especially in response to changes in environmental conditions; e.g., viruses that become resistant
to drugs. Microevolution is essentially the change among offspring that comes from the genetic variability that occurs within species (e.g., the diversity of breeds observed among dogs). In microevolution the changes in organisms due to the processes of mutation and natural selection can be readily seen and verified in the natural world and thus are not generally considered to be controversial.

**General Theory of Evolution (Macroevolution).** The General Theory of Evolution expands on the Special Theory so as to hypothesize that microevolutionary processes lead to macroevolution, where all living species have evolved by a gradual natural process from nonliving matter to simple microorganisms, leading eventually to plants, animals, and humans. For many evolutionists, macroevolution also embodies the philosophy that everything (living and non-living) has evolved by chance and not by the will and direction of God. This is the part of evolution that is so controversial and which is considered by Christians to be diametrically opposed to the Bible.

Inherent in the Theory of Evolution are the concepts of:

*Species.* The most common definition of “species” among lay persons is “animals or plants that look alike and which can interbreed and produce fertile offspring.” However, in reality the term “species” is difficult to define because every imaginable gradation exists, and for this reason there is no universal agreement among biologists as to what constitutes a species. In the microbial world, the concept of species is semi-meaningless because microbes such as bacteria are asexual and commonly swap DNA. In the plant and animal world, genetically distinct populations may look alike, whereas genetically close populations may look dissimilar. Another problem (among many) with formulating an accurate definition involves subspecies, where no clear line exists between species. Subspecies of animals may be genetically capable of
interbreeding (e.g., tigers and lions), but may not recognize one another as mates. Or, if subspecies do interbreed, they may not produce fertile offspring (e.g., a female horse bred with a male donkey produces a mule, which is sterile). Given the complexity of life, the term “species” cannot be pigeonholed into a nice, neat, and fully self-consistent definition.

**Mutations.** Genetic changes in organisms take place by mutations. It is this genetic component that is passed on to succeeding generations, forming the impetus for evolution, which is (by one definition) simply the gene frequency through time. Mutations occur along gene positions called “loci”. Often mutations are harmful to an organism, but they can also be advantageous. Genetic mutations are considered by most evolutionists to be without direction; that is, they occur randomly.

**Natural Selection.** Natural selection operates by the environment acting to select “the fittest”. A classic example of natural selection is where moth populations darkened in color during England’s Industrial Revolution corresponding to an increase in industrial dirt and grime. In this case the species didn’t change to another species, just some characteristics of the moth population changed. Another classic example of natural selection is how the beaks of finch populations on one of the Galápagos Islands changed in response to wet and dry years and expanding or dwindling food supplies.¹

“**After Its Kind**: What Does This Phrase Mean? 

People who oppose evolution on biblical grounds usually quote the phrase “after its kind” used in Genesis 1:10-11, 21, 24-25 to support their position that God created each species separately and that each species has been fixed since their creation (a position referred to as the “fixity” or immutability of species). This position is inherently based on a modern understanding
of what a species is and what is involved in Darwinian evolution. However, what did the phrase mean from the worldview of the biblical author(s)? Remember from Chapter 1 that the pre-scientific Mesopotamians knew only what they could observe. Also remember from Chapter 2 that the claim was made that a Literary view of Genesis 1 negates the conflict of the phrase “after its kind” with evolution. The next sections try to explain why no conflict exists from a worldview perspective.

“After its Kind” in the Old Testament

The phrase “after its kind” is not only used in Genesis 1 (Gen. 1:11, 12, 21, 24, 25), but also in Genesis 6 (Gen. 6:20) and Genesis 7 (Gen. 7:14), and in Leviticus (Lv. 11:14, 15, 16, 19, 22) and Deuteronomy (De.14: 13, 14, 15, 18). In addition, the phrase “after their kinds” and “according to their kinds” (plural) is used in Genesis 8:19 and Ezekiel 47:10, respectively. It is only in Genesis 1 that the term “after its kind” is used when referring to God’s creation of the living world. In Genesis 6 and 7 and in Leviticus and Deuteronomy it is used in reference to dietary restrictions, and in Genesis 8:19 and Ezekiel 47:10 the term applies to general categories of animals where the propagation of species is not implied. This is the first thing to note about the use of “after its kind” in the Old Testament: it conforms to the repetitive and prosaic literary style of ancient Near East texts, where a type of “Bible-speak” is used. This type of speech is similar to what was discussed in Chapter 4 with regard to such phrases as “all the earth” or “every nation under heaven.”

The second thing to note is how the phrase “after its kind” fits within the overall numerological harmony of the Genesis text. The phrase is used in seven different verses (Gen. 1:11, 12, 21, 24, 25; Gen. 6:20; Gen. 7:14), seven being the sacred number of the
Mesopotamians (see Chapter 3). It is used only once in Genesis 1:11; it is repeated twice in each of the verses of Genesis 1:12, 1:21, and 1:24; and three times in Genesis 1:25, adding up to ten, the decimal base of the Mesopotamians’ combined sexagesimal-decimal numbering system. Furthermore, in Genesis 6 “after its kind” is repeated three times and in Genesis 7 it is repeated four times, again adding up to seven. Thus, this phrase was intentionally woven into the text by the biblical author(s) in keeping with the numerological style of sacred narratives.

The word “kind” (mîyn or mîn) in “after its kind” comes from an unused root meaning to portion out or separate as in a “splitting off”. From an etymological study of the word mîn, Payne concluded that the original word must refer to subdivisions within the types of life described, and not to the general quality of the types themselves. But if “mîn” refers to subdivisions, what subdivisions was the biblical author referring to? Various scholars – in order to claim biblical support for their own particular point of view (e.g., Young-earth creationism, theistic evolution) – have equated “kind” with species, genus, family, and even higher orders in the scientific classification scheme of Linnaeus. But are these subdivisions what the original biblical author had in mind? Can a “splitting off” be construed to support the splitting of species in divergent evolution, as has been done by some? Does “mîn” refer only to fixed species, or can it also refer to new species that have evolved over time? Technically speaking, in evolution each generation exhibiting a slight genetic change does reproduce exactly after its kind (the mutated gene is passed down to its offspring).

“After Its Kind” and Folk Taxonomy

The plant and animal classification scheme of Linnaeus is part of our “modern” scientific tradition, one that characterizes a complex society. However, pre- or proto-scientific peoples
have botanical and zoological classification schemes of a more shallow hierarchical structure, ones that are based on the most distinctive species of a local habitat and on the characteristics of plants and animals that humans can readily observe.\(^5\)

Folk zoological classification schemes are exhibited by cultures all around the world. These “native” taxonomies characteristically break down the classification of animal life forms into one or more of the following categories:\(^6\) (1) *Fish* (aquatic animals, mostly fish but even whales); (2) *Bird* (animals that can fly, usually birds but occasionally bats); (3) *Snake* (creeping animals such as snakes and lizards); (4) *Wug* (worms + bugs, or in general the insect world); and (5) *Mammals* (in general, large animals, mostly mammals, but even large forms of reptiles). How many of these categories a society has depends on its stage of complexity. Primitive societies may have only one to three of these categories. More highly organized, proto-literate societies (like the ancient biblical ones) may have three or four of these categories, whereas modern societies have all five. It is apparent that these “native” categories do not correspond to our modern scientific classification scheme based on comparative anatomy and DNA, but rather are based on the most obvious features or actions of these animals. Whales are not fish, but they swim in the ocean like fish. Bats are not birds, but they fly in the air like birds. Reptiles are land animals like mammals, so they are categorized together in folk taxonomy schemes.

The four life-form categories mentioned in Chapter 1 of Genesis (and elsewhere in the Old Testament) are typical for a proto-literate society, both in number and in their non-scientific nature: fish (water dwelling creatures including fish, but also whales;\(^7\) Gen. 1:21); bird (flying creatures, Gen. 1:21; but also bats, Lev. 11:19); snake (every creeping thing, *remeš*; Gen., 1:24, 25); and mammals (*bēhēmāh*, meaning “dumb beasts” like domesticated cattle, but also *chay*, meaning “wild beasts”; Gen. 1:25). If compared to our modern Linnaean system, the four native
life forms of Genesis 1 essentially equate with class, the subdivisions of which are order, family, genus, or species. In reality, the meaning of “kind” (mîn) in the Old Testament can refer to any of these divisions, and in some cases even to phyla. It depends on a number of factors which taxonomic subdivision is used, especially on the type and size of the plant or animal and its importance (e.g., edibility). Usually for mammals and birds – but also for the larger reptiles and amphibians – the word mîn (“kind”) in the Old Testament corresponds to genus or species. For example, in Leviticus 11:15 and Deuteronomy 14:14, the “raven after its kind” presumably includes all six species of the genus Corvus. However, with the owls, each of Palestine’s eight owl species is mentioned, from the huge eagle owl down to the tiny scops owl (mistranslated in early versions of the Bible as ibises, water hens, swans, seagulls, and cuckoos for one or another of these owl species).

The most important point to gain from the above discussion on folk classifications is that the ancient Mesopotamians were still at the stage where they were using a native classification system. Therefore, the subdivisions of mîn are for this native system and cannot be made equivalent to our Linnaean categories of order, genus, species, etc. The text of Genesis 1 fits historically within a proto-literate society having no knowledge of our modern-day scientific classification system, which shows that God did not impart advanced scientific knowledge to the ancient Mesopotamians, but gave His revelation to people with a naïve scientific view commensurate with that time and place.

“After its Kind” and the Worldview of the Mesopotamians

The discussion so far has still not specifically addressed what the biblical author meant by “after its kind” in Genesis 1 in terms of its obvious reference to the creation and procreation
of the plant and animal world. For this, one must understand the worldview of the people of that day and their close relationship to the land and pastoral way of life. The ancient Mesopotamians were savvy when it came to plant and animal reproduction because their livelihoods depended on raising crops and herding livestock. Even as early as Uruk time (~3800-3100 B.C.; Table 7.2) archaic cuneiform texts from Uruk document the categorizing of sheep into breeding bulls and rams, an indication that these people had some knowledge of selective breeding. Genesis 1:11 breaks the general class of “vegetation” (deshe’) into separate categories of herb-bearing seed and fruit-bearing seed, both kinds of seeds representing important food sources for a farm-based economy.

As with their concept of the cosmos (Fig. 1.1), the ancient Mesopotamians knew only what they could observe of the natural world. They knew that when they planted a barley seed (the main food crop of ancient Mesopotamia) a flax plant didn’t grow from that seed – barley grew from it. This is the connotation of “after its kind” of the herb yielding seed in Genesis 1:12. They knew that when they planted a fig seed, they didn’t end up with a pomegranate tree. This is the connotation of “after its kind” of the tree yielding fruit, whose seed is in itself in Genesis 1:12. Also, they observed that animals produce after their own kind (Gen. 1:21): a whale doesn’t give birth to a fish, a crow doesn’t produce a dove, a donkey doesn’t produce a sheep. So in this respect, the biblical author(s) did mean procreating species, and their definition of “species” would probably have been about the same as the popular definition of today: “animals or plants that look alike and which can interbreed and produce fertile offspring.” This is the practical way of defining species, one in accordance with the everyday experience and knowledge base of the people of the ancient Near East.
“After its Kind” and Evolution

What then does “after its kind” have to do with the controversy of evolution versus the fixity of species? Nothing, because the biblical author(s) of 2500-1500 B.C. had no concept of the evolution of one species into another. Whether evolution does or does not occur slowly over time is not something that they could have observed. Therefore, from a worldview perspective the biblical phrase “after its kind” cannot imply either the viability or non-viability of evolution. The biblical author(s) of Genesis 1 was completely pre-scientific in his method and motives, and we are reading our modern scientific worldview into the text when we take the phrase “after its kind” and apply it to the Theory of Evolution. The distortion of the meaning of mîn arises not from the subdivision of the word into “species”, “genus”, or whatever taxonomic category is championed, but from forcing the implications of modern scientific knowledge onto the ancient biblical text.12

The “Theory” of Evolution

While the phrase “after its kind” does not apply to the Theory of Evolution as we understand it today, this does not mean that the Bible is theologically neutral on the subject of evolution. The Bible emphatically claims that God/Christ is the creator of the universe and all that is in it: For by him were all things created, that are in heaven, and that are in earth, visible and invisible, whether they be thrones, or dominions, or principalities, or powers – all things were created by him, and for him. And he is before all things and by him all things consist (hold together) (Col. 1:16-17). According to the Bible the universe and life did not happen by chance as claimed by naturalistic evolutionists. This is where science and the Bible are in conflict, and is
the topic that will be covered for the remainder of this chapter. What evidence does science have to support evolution, and why is it called the “theory” of evolution rather than the “law” of evolution?

What is a Theory?

To understand the reason why it is called the “theory” of evolution, we must first establish what a theory is. A simple drawing and explanation may help clarify this for people who are not scientists (Fig. 6.1).

![Figure 6.1](image)

**Figure 6.1.** How science works: more and more scientific observations or facts lead from a simple, untested hypothesis (wag) to a theory and finally to a law.

In this diagram, we are going to start on the left with an untested hypothesis, or “wag”, then proceed up the staircase to a theory, and then to a law. The individual stair steps represent scientific observations, either resulting from laboratory experiments or from documented observations of the natural world.

**Wag.** The letters in the word “wag” stand for a Wild Assumption or Guess. A wag is based on one or two observations, but not on scientifically verified observations or experiments. An example of a wag is the hypothesis that dinosaurs exist on the planet Venus. (This was
actually proposed by some people years ago, like the “canals” of Mars). Here is the logic: with a telescope we can see an immense cloud cover over Venus \( \rightarrow \) clouds mean warm rainy weather \( \rightarrow \) warm rainy weather means a tropical climate and lots of vegetation \( \rightarrow \) and what animals on Earth lived in a warm tropical climate with lots of vegetation? \( \rightarrow \) dinosaurs! What is wrong with this conclusion? It is based on “leaps of logic” not verified by scientific observations or facts.

The real fact of Venus is that it has surface temperatures of 900°F – or about as hot as your oven broiler. The thick atmosphere of Venus (which we see as clouds with our telescopes) actually works as a super-greenhouse, which traps heat on the planet’s surface and causes the unbearably hot temperatures. There is no life whatsoever on Venus. It is a hot, lifeless planet, a fact verified by space probes that have landed on the planet’s surface.

**Theory.** The next step up the stairs is a theory. A theory is a proposed explanation that tries to incorporate all of the known observations, but whose status is still somewhat conjectural because of the ambiguity or lack of information. The scientific process is to propose a hypothesis (idea) and then test it with observations (facts), whereupon it becomes a theory. As more observations come in, then the theory is altered in order to accommodate these new facts. Thus, establishing a hypothesis as a theory is a long process where one kind of “homes in” on the truth by trial and error. That is why (to the general public) scientists always seem to be “changing their minds” and coming up with new theories on a particular subject.

**Law.** As we go up the staircase of Figure 6.1 we finally reach a law. A law is any rule or principle governing natural phenomena that can be observed to occur over and over again. An example is Newton’s Law of Gravitation. If you drop a ball time after time and measure its rate of falling, you will get the same result over and over again. But, even a law is not inviolate and new discoveries can modify a law. For example, Einstein’s Theory of Relativity changed the
understanding of Newton’s laws. Newton’s laws work here on Earth for all practical purposes, but it is mandatory that Newton’s laws be augmented by including Einstein’s equations when considering objects traveling at velocities approaching the speed of light.

**Facts Versus the Interpretation of Facts**

A theory is built on observations or facts, but it also involves the *interpretation* of these facts. A theory considers the facts (however many there are) and tries to incorporate all of these facts into a coherent model of reality. This is where the problem arises, especially in the case of the Theory of Evolution where experiments (like dropping a ball over and over) cannot be done and one must depend mainly on *circumstantial* evidence. In the next section we will be discussing the “pros” and “cons” of the theory of evolution. All of these involve facts or observations – but how should these be interpreted? People who favor evolution stress the “pros”; people who do not favor evolution stress the “cons”. And each end up with a basic model that is different from the same set of “facts”.

Most important in judging the evidence is to separate the “facts” from the theory itself. For example, the anthropological and archeological evidence for early *Homo sapiens* (to be discussed in Chapter 7) is completely independent of the Theory of Evolution. The evidence for the existence of early humans depends on the physical remains (e.g., bones) of humans and the artifacts (e.g., scraper tools) they produced, and also on the dating of these fossils and artifacts. This evidence would be unchanged if Darwin had never lived.\textsuperscript{13} Also in the case of a theory it is especially important to have an open mind and non-dogmatic spirit because new facts are often uncovered which can alter one’s interpretations.
The Pros and Cons of Evolution

Before we cover the different Christian positions on evolution, we must first clarify what the scientific evidence for and against this theory is in order to be able to judge why people hold different positions. We will discuss only the four most relevant “pros” and “cons”.

Pros

(1) Comparative anatomy. In 1735 the Swedish botanist Carolus Linnaeus (Carl von Linné) proposed the first taxonomic classification system for all living things based on comparative anatomy. For example, you have five digits on each hand, and so does your cat and dog; all species of the cat family look and act the same, etc. You probably learned Linnaeus’ classification system in high school biology:

| Kingdom = animals, plants, archaea |
| Phylum = 21 groups; e.g., chordates (animals with backbones) |
| Class = e.g., reptiles, mammals |
| Order = e.g., primates |
| Family = e.g., hominids (fossil “man”) |
| Genus = e.g., Homo (man-like) |
| Species = e.g., Homo sapiens (modern man) |

As you move from the more general (phyla) to the more specific (species), the more closely related living things become anatomically. For example, hominids are more closely related to other primates than to bacteria. This anatomical sequence strongly suggests a connection between all of life, but it doesn’t prove a connection. God could have followed the same “blueprint” and created life to only appear connected.

(2) Comparative genetics (DNA). How far apart animals are genetically seems to correspond to their comparative anatomical structure. In particular, recent DNA studies have confirmed that the genetic material of all living creatures is made up of similar sequences.
Furthermore, the closer an animal is to another animal on the Linnaean system, the closer their DNA structure is to each other. While some of the positions of plants and animals on Linnaeus’ taxonomic “family tree” are now being shifted due to DNA studies, this system based on anatomy has held up remarkably well for almost 300 years.\textsuperscript{14} If one considers the amount of nucleotide material that is genetically identical between humans and other animals, the approximate comparative percentages come out to be:\textsuperscript{15}

<table>
<thead>
<tr>
<th>Species</th>
<th>Genetically Identical to Humans</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{E. Coli} (bacteria)</td>
<td>\textasciitilde 45%</td>
</tr>
<tr>
<td>Chicken (bird)</td>
<td>\textasciitilde 90%</td>
</tr>
<tr>
<td>Rabbit (mammal)</td>
<td>\textasciitilde 95%</td>
</tr>
<tr>
<td>Chimpanzee (primate)</td>
<td>\textasciitilde 99%</td>
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</tbody>
</table>

Our human sequence of genes – including “derelict” genes – is almost identical to that of chimpanzees. Derelict genes are either ancient relics of once-active genes, or randomly generated copies of genes. It is extraordinary to view large segments of chimp and human DNA, aligned side-by-side, and see the same sequence of genes and derelict genes.\textsuperscript{16} This remarkable correspondence strongly implies that both species (and other higher primates) are products of one lineage where these derelict genes were generated. Or, as Francis Collins, Christian biologist and head of the Genome Project, has remarked: “Certainly this kind of evidence is strongly in support of evolutionary theory.”\textsuperscript{17}

Genetic connections between animal species – and thus their probable ancestry – can now be made because genetic history is inscribed in DNA sequences. An example of how DNA can help determine ancestry is a study done on a woolly mammoth that died several millennia ago in Siberia.\textsuperscript{18} In this study it was found that while 95.5\% of the mammoth’s mitochondrial DNA matched that of the African elephant, more than 95.8 \% corresponded to that of the Asian elephant, suggesting a common ancestor for mammoths and Asian elephants.
Again, such studies don’t prove an evolutionary connection because God could have used successful design principles over and over again in separate creative acts, but it is certainly strong circumstantial evidence that all of life must somehow be developmentally connected.

(3) **Overall arrangement of the fossil record.** As discussed in Chapter 5, the fossil record is not a random hodge-podge of fossil plants and animals such as might be expected if they had been deposited in a catastrophic flood: there is a definite order to this record (Table 5.1). Less complex organisms (bacteria, algae) are found in the lowest and oldest sedimentary rock layers, while the more complex organisms (mammals) are found in the topmost and youngest layers. Importantly, with regard to our discussion here, this less complex to more complex geologic fossil record corresponds with the anatomical and DNA progression shown in the above shaded diagrams. This correspondence adds even more weight to the evidence that all life is connected.

(4) **Vestigial and embryonic organs.** Vestigial organs are body parts no longer used by an animal but which supposedly attest to an evolutionary ancestor that did use them. For example, whales are believed to have evolved from a four-legged mammalian ancestor that walked on land about 50 million years ago, and the ancient legged whales *Ambulocetus* and *Rodhocetus* were transitionary forms between today’s whales and this land ancestor.19 Today we don’t usually see whales with legs, so this evolutionary connection is not obvious. However, on rare occasions a “throwback” is encountered – a modern whale is hauled in with a hind leg, complete with thigh and knee muscles, sticking out of its side.20 The appearance of vestigial organs are controlled by “suppressor genes,” or genes that are stored in an “inactive file,” just as there are suppressed inactive files in your computer. Thus, every once in a great while an entire sequence of a suppressed genetic code of an animal can emerge – such as the case of a modern
whale reverting back to producing legs from the pelvic area where legs supposedly used to grow millions of years ago in its whale ancestors.

Embryonic organs are those that emerge during the early stages of embryonic development, but which disappear before or after the organism’s birth. Human embryos, for example, form a yolk sac during the early stages of their development. In birds and reptiles, a similar sac surrounds a nutrient-rich yolk, but in the human embryo the yolk sac is empty. Such organs that are present in embryos but not in adult organisms are viewed by many evolutionists as evidence of the evolutionary ancestry of that organism.

Cons

(1) Problems With the fossil record. We are going to cover three aspects of the fossil record that are troublesome with respect to the Theory of Evolution: (a) the appearance of the first fossils in the Archean (Fig. 3.4), (b) the so-called “Cambrian explosion” at the end of the Proterozoic (Table 5.1), and (c) the claim that the fossil record is incomplete and devoid of intermediate transitional types such as should be expected from evolutionary theory.

Appearance of first life on Earth. The oldest known fossils have been found in Archean rock dating to about 3.5 billion years ago. Algal and bacterial fossils have been recovered from the ancient sedimentary rocks of South Africa and western Australia, and there is also evidence from rocks in western Greenland that life may have existed on planet Earth as long ago as 3.8 billion years. These findings challenge the supposed long time spans needed for evolution. If the Earth is 4.5-4.6 billion years old (Chapter 3), then how could life have evolved from non-life in less than a billion years? This problem has caused some scientists to conceptually transfer the
origin of life to outer space, with life inhabiting the Earth from space as soon as its surface and atmosphere became fit to support life.

These findings bring up an even more important question: How could life evolve from non-life \textit{in any period of time}? The probabilities against this happening are astronomical, if astrophysicist Fred Hoyle and his colleague Chandra Wickramasinghe are to be believed when they calculated the probability of life evolving by pure chance at $10^{-40,000}$. This statistical improbability was more vividly expressed by Hoyle in his now famous metaphor: That a living organism can emerge by chance from a pre-biotic soup is about as likely as “a tornado sweeping through a junkyard might assemble a Boeing 747 from the material therein.” \textsuperscript{22} And, transferring the origin of life to outer space doesn’t help the situation because if these statistics are correct, life would not have had enough time to evolve in the universe in 13-14 billion years any more than it could have evolved on Earth in 1 billion years.

\textit{Cambrian explosion.} Soft-bodied, multi-cellular animals burrowed or left imprints in sediments as long ago as 630 million years in the late Proterozoic. Then in the Cambrian, at the start of the Paleozoic Era (~570 million years; Fig. 3.4), marine animals began constructing calcium carbonate shells, thus leaving a preservable record of themselves. Within a few million years or so – in the blink of an eye by geologic standards – nearly all of the major phyla known today suddenly appear in the fossil record. This rampant proliferation of animal life is called the “Cambrian explosion.” Early Cambrian life is best represented in the Burgess Shale of British Columbia (Fig. 6.2). The body plans that first appeared in the Cambrian have, by and large, served as the original blueprints for all animals that have lived since then.
The evolutionary questions that the Cambrian explosion raises are: Why did these body plans appear so suddenly and simultaneously, and why have no other basic body plans appeared for over a half a billion years? From what earlier fauna did these Cambrian animals derive? The only known animal-like fossils that predate the Cambrian (the Ediacarans) seem to belong to an evolutionary dead end. A number of unsatisfactory explanations have been offered for the Cambrian explosion. For instance, perhaps there were many ecological niches open to fill at this time, or perhaps animals evolved faster at that point in history. Or, perhaps not only did creatures evolve hard shells at this time, but also the first image-forming eyes. The Cambrian explosion is the most remarkable and puzzling event in the history of life on Earth. It is crucial to fully understanding the process of evolution, but it still remains a mystery.

**Transitional fossils.** The basic premise of macroevolution is that species gradually change into other species over time. The question then arises: Why do we not see innumerable transitional forms everywhere in the fossil record? Darwin himself asked this question 150 years ago. At that time it was assumed that transitional forms must be present in the fossil record, but the reason these fossils had not yet been found was because so little of the Earth’s sedimentary rock had been examined. Today practically all of the sedimentary rock on Earth has been field
checked and placed within the framework of the geologic column (Fig. 3.4). Yet, transitional forms are still scarce in the fossil record.

Many people within the Christian community have heard it stated that “there are no transitional forms” in the sedimentary record. This is not true. There are examples of fossils with transitional morphologies at all taxonomic levels, from species to phyla. Some notable examples of these transitional forms are the fossilized whales discussed earlier, and *Archaeopteryx*, one of a number of fossil reptile-birds that have been found. *Archaeopteryx* displays both a reptile skeleton with a full set of teeth and a long bony tail, and also wings and avian feathers (Fig. 6.3). In the case of invertebrates, there are a number of fossils that record evolutionary trends. Two examples are the Jurassic oyster *Gryphaea*, which shows progressive changes in shell coiling, thickness, and size over time, and the Miocene foraminifer *Orbulina*, where intermediate forms are known in exceptionally complete stratigraphic sequences. Despite such transitional forms documented in the fossil record, the question still remains: Why are these seemingly the exception rather than the rule?

![Archaeopteryx](image1)

**Figure 6.3.** *Archaeopteryx* (left), a prehistoric bird that lived in the Jurassic ~150 million years ago. The skeleton is reptilian, yet it displays feathers. The feathers (above) of *Archaeopteryx* are virtually identical to the feathers of modern birds. These fossils were unearthed in the limestone quarries of Germany. Copied from May, 1990 Scientific American article by Peter Wellnhofer. NEED PERMISSION.
Here is the norm for the fossil record: the sudden appearance of a species and then “stasis”, where the fossil form can remain unchanged in layer upon layer of rock for millions of years. Notable examples of static species are the one billion year old fossils of blue-green bacteria, which look exactly like their modern “pond scum” counterparts,27 or stromatolites that closely resemble stromatolites living today (Fig. 5.3). An invertebrate example of a static species is the horseshoe crab, which still comes upon New England shores to spawn every year, and which has remained relatively unchanged (a “living fossil”) since the Early Triassic (Fig. 3.4). A notorious vertebrate example is the coelacanth, a “fossil fish” dredged up from the deep waters of the Indian Ocean and off of South Africa, and which has remained relatively unchanged from its Devonian to Cretaceous predecessors.

Such “stasis” in the fossil record was what prompted Niles Eldredge and Stephen Jay Gould in 1977 to propose their “punctuated equilibrium” model, which characterizes evolution as consisting of long periods of little change punctuated by relatively brief periods of rapid change.28 Punctuated equilibrium is actually not a new theory of evolution, it is just a new label for a mode of evolution that recognizes stasis in the fossil record, in contrast to “gradualism,” which is the concept prevalent since Darwin’s time of slow uninterrupted evolution. The importance of punctuated equilibrium is that it does try to take the actual fossil record into account. However, this mode of evolution is impossible to prove from the fossil record. Given a fossil in the lower part of a rock formation, one may infer that a similar fossil in the upper part is a “punctuated” descendent of the lower one, but it is only an inference.

It is important to realize what factors are not implied by the geologic record for the sudden appearance of a species followed by stasis. The theory of punctuated equilibrium does not imply that species appearing instantaneously in the fossil record are “fully formed” in an
“after its kind” fiat biblical sense. To a geologist “sudden, brief periods of rapid change” may amount to only tens of thousands or a few million years, rather than tens to hundreds of millions of years. This record also does not necessarily imply that species do not evolve into other species. Pond-scum bacteria could have remained in their particular habitat for a billion years and thus not have changed, whereas other descendents of this bacteria could have evolved into many other different ecological niches.

Furthermore, “fully formed” species could have evolved from transitional species not preserved in the fossil record. A number of reasons can be invoked as to why so few transitional forms are preserved. With regard to the marine record, it could be that transitional populations remained small as they adapted to ecological niches. Then, once they occupied an available niche, they quickly multiplied to fill that niche and then remained static after that. In this way, their appearance would seem instantaneous, punctuating an otherwise static record. With regard to the land record, it is not surprising that transitional forms are not found since this environment is not conducive to fossilization. Land reptiles, birds, and mammals only become fossilized under special and optimal conditions.

Having said all of this, it is still puzzling to paleontologists and evolutionists why there are not more transitional forms in the fossil record. If macroevolution is true, then mechanisms must exist which account for the sparsity of transitional forms and for the sudden appearance of fossils in the Cambrian explosion and afterwards. But, 150 years after Darwinian evolution was introduced, these specific mechanisms are still not understood.

(2) Problems With Macroevolution. Macroevolution involves the change of organisms to other organisms over time. Macroevolution is especially concerned with the origin and evolution of the higher taxonomic groups (families and classes), as displayed by changes in the
fossil record through time. Basic problems with macroevolution involve speciation – both with respect to how it can occur and how fast it can proceed.

**Speciation.** Speciation is the development of one species from another species, the criterion for a separate “species” usually being defined as the incapacity to breed with the parent species. Let’s take the case of the Galápagos finches mentioned previously. From a 16-year study done on one of these islands, Daphne Major, Peter and Rosemary Grant have shown that natural selection is responsible for the microevolutionary changes observed in finch beak size due to wet and dry years. These selection pressures did not produce a new finch species – it just produced population variations in the finch species on Daphne Major. However, finches on other of the Galápagos Islands are different species, incapable of interbreeding with each other. Thirteen different finch species exist on these islands, supposedly diverging from one parent species in the last 1-5 million years or less (determined from the age of these volcanic islands). What impressed Charles Darwin on his 1835 visit to the Galápagos Islands during the voyage of the *HMS Beagle* was the fact that the variety of beak forms possessed by these different finch species had become adapted to the variety of food types on the different islands, and thus these finches were instrumental in providing Darwin with the physical evidence of natural selection at work. This demographic information strongly infers that given enough time, selection pressures can produce the emergence of new species. But the question is: how do selection pressures manage to change the genetic makeup of an organism so that it becomes a new species?

**Time needed for speciation.** It is well known that microevolutionary-type changes can happen fast. But it also appears that speciation (macroevolution) can also occur rapidly. For example, the cichlid fish of Lakes Victoria and Malawi have evolved at a dizzying pace. Amazingly, the more than 400 cichlid species appear to have evolved within approximately the
past 200,000 years as the lakes became disconnected from each other along the African rift zone. This and similar studies suggest an important possible mechanism behind speciation: isolation, where small populations are isolated on the periphery of a species’ geographical and ecological range. However, isolation does not answer the question of how this process causes the mutations necessary for rapid species divergence.

(3) **Problems With Natural Selection.** Not only are the mechanisms of macroevolution poorly understood, but the proposed mechanism of natural selection is also enigmatic. Three main categories of problems exist with respect to natural selection: (a) speciation, (b) irreducible complexity, and (c) cellular automata.

*Natural selection and speciation.* According to Darwin, natural selection shapes species because the fittest survive and reproduce, passing on their genes to the next generation. Darwin thought that natural selection represented the primary directing force of evolutionary change, one that was responsible for producing the complexity of animal life that we see in the world today. But is it? As was discussed above, one cannot prove that natural selection creates new species, only that it is responsible for modifying populations within a species. It is not even clear that natural selection is the most important force driving evolution. Could genetics be the primary determinant of evolutionary change, with natural selection only modifying a species once it has genetically diverged into a new species?

*Natural selection and irreducible complexity.* Another debate regarding natural selection is: How can natural selection account for the incipient stages of useful structures? Let’s use the eye as an example, as is so often done. How does an incipient eye first develop in order for it to be naturally selected upon? Darwinian evolution would say that the eye evolved by a step-by-step process through a series of intermediates in infinitesimally small increments. But what about
the first increment, the one that leads eventually to the evolution of a total eye? How did that first increment come about? By a random mutation? Or by some directed process that produced the many genetic mutations needed for a full-blown eye?

Molecular biologist Michael Behe in his book *Darwin’s Black Box* calls this natural selection dilemma “irreducible complexity.” An irreducibly complex system cannot be produced by slight, successive modifications of a precursor system because any precursor to an irreducibly complex system that is missing a part is by definition nonfunctional. In other words, since natural selection can only operate on systems that are *already working*, then if a biological system cannot be produced gradually it would have to arise as an *integrated unit*, in one fell swoop, for natural selection to have anything to operate on. Or in Behe’s words, if in the evolution of parts $A \rightarrow B \rightarrow C \rightarrow D$, parts $A$, $B$, and $C$ have no use other than as precursors to $D$, what selective advantage is there to an organism to make just $A$, or in making $B$ from $A$, or $C$ from $B$, or $D$ from $C$? Behe’s main argument is that evolution could not have proceeded entirely on its own. It had to have been designed and directed by an intelligent force.

On the other side of the “irreducible complexity” argument, cell biologist Kenneth Miller, author of *Finding Darwin’s God,* questions Behe’s reasoning, calling it the old “argument from design” in disguise. According to Miller, what evolution does is begin with separate parts (basic structures that serve different purposes) and then it modifies them so that when they come together the whole of the parts has a new function different from the old parts. Once this remodeling is complete, then every part of the reconstructed working system becomes necessary, thus giving the *appearance* of design. Miller demonstrates this evolutionary functionality by giving an example of how bacteria utilize lactose. Miller calls these bacteria “smart” and “clever” because they can switch the glactosidase enzyme on and off to metabolize lactose when
it is, or is not, present. How does this mutant response occur? Miller’s answer is that the bacteria “tinker” with another gene, in which a simple mutation changes an existing enzyme just enough to make it capable of cleaving the bond that holds the two parts of lactose together.

The perplexing part of Miller’s argument is how such “tinkering” occurs. What process drives the simple mutation so that it is just capable of utilizing lactose? And, is this mutation “simple” or do multiple mutations have to occur in evolution? Does the “problem” itself stimulate the “fix”, and if so, how? Does the “regulatory system” that performs this function have a feedback mechanism that was designed into the system? And, if this is the case, is this an example of intelligent design (Behe’s position) or only the appearance of design (Miller’s position)?

Natural selection and cellular automata. Darwin and evolutionists since Darwin have attributed the complexity one sees in biological populations to the processes of natural selection and adaptation. But despite this scientific consensus no clear explanation has ever emerged as to how such processes should lead to complexity. In his book A New Kind of Science, theoretical physicist and Mathematica innovator Stephen Wolfram has argued that complexity in biological systems has very little to do with adaptation or natural selection, but that it is possible to get remarkable complexity even from simple programs based on the process of “cellular automata”. “Cellular automata” is where a very complex graphical pattern is computer generated on a two-dimensional grid of many cells. The pattern initiated by exciting the first cell spreads to other cells around it, the spreading being dictated by a set of logical mathematical rules. The rules associated with each cell are very simple, yet the final result is a pattern of surprising complexity and reproducibility.
Wolfram is surprised at the universal conviction of evolutionary biologists that any significant property one sees in an organism must be there because it serves a purpose in maximizing the fitness of the organism, and he strongly suspects that such purposes have very little to do with the real reasons that these particular features exist. Instead, these features arise just because they are easy to produce with fairly simple programs. In other words, the complexity we see in biological populations arises from straightforward mechanisms, not from mechanisms that rely on elaborate refinement through a long process of evolution.

The reliance on basic simple mechanisms may help explain the fossil record, where the body plans for animals have essentially remained the same since the Cambrian explosion. It may also explain “convergent evolution” where certain body structures appear repeatedly in the biological world because they share an underlying mechanism. Wolfram concludes that: “many of the most obvious features of complexity in biological organisms arise not because of natural selection, but rather in spite of it.”

The process of “cellular automata” provides the framework for development of very complex, reproducible patterns without further direction by the computer programmer. However, these patterns by virtue of their complexity alone do not necessarily serve a useful purpose. But if the process were to be reviewed, scrutinized, and controlled at various stages by an intelligent programmer, a very useful end result could be achieved. Such intelligent feedback could produce the complexity seen in life forms.
Judging the Data

As a way of trying to make sense of the data presented in the above “pros” and “cons” section, I would now like to approach the subject of evolution from two different perspectives: (1) as a “court” case with evolution “on trial”, and (2) from my own personal experience.

Beyond a Reasonable Doubt?

Consider a court case where a person is on trial for murder. In such a trial two types of evidence are permitted: the facts (DNA evidence, murder weapon with person’s finger prints on it, etc.) and circumstantial evidence (person was near the scene of a crime, the person has no verifiable alibi for his whereabouts, etc.). The person on trial can be convicted on factual evidence, or he can be convicted on circumstantial evidence alone – if this circumstantial evidence is strong enough to convince a jury of guilt “beyond a reasonable doubt”.

Let’s now investigate how the theory of evolution might hold up in a court case, considering all of the “pros” and “cons” discussed in the previous section. First, the circumstantial evidence for evolution is very strong. The anatomical evidence, DNA evidence, and overall arrangement of the fossil record independently support each other, and all of this evidence, taken together, attests to a grand connection for the Earth’s biological systems over time. However, this evidence does not necessarily prove an evolutionary connection because the process of evolution has not been tested in the laboratory, nor has it ever been empirically demonstrated how this process works. Geologic succession of fossils does not reveal how a species came into existence, it only reveals when it came into existence. Or, to quote an old adage: “there is a good deal of circumstantial evidence, but all the eyewitnesses seem to be dead.”
On the other hand, the negative (“con”) evidence against evolution doesn’t necessarily mean that the theory is not valid. It may only mean that the actual mechanisms behind evolution remain elusive. Evolutionists seem to have all the answers because they build their case on inductive reasoning, but in some measure this logic is a “smoke screen” hiding the truth that the facts necessary for a clear verdict do not exist in this case. Something very fundamental to this theory must be missing. There are just too many basic questions that cannot yet be answered.

If you were a jury member on this trial, how would you vote? Is the circumstantial evidence strong enough for you to render a verdict beyond a reasonable doubt? Many people think that the evidence is strong enough and that is why they consider evolution to be a “fact”. Others need more hard data to be convinced.

**The Case of Cave Fish**

I am a geologist by training, specifically a geologist who has specialized in caves for over 40 years. Although I am not a biologist, I am familiar with cave life and the remarkable

![Figure 6.4A. Orconectes pellucidus, troglobitic eyeless crayfish, Mammoth Cave, Kentucky, USA (photo: Chip Clark). NEED PERMISSION](image1)

![Figure 6.4B. Amblyopsis spelaeus, troglobitic fish, USA (photo: Chip Clark). NEED PERMISSION](image2)

![Figure 6.4C. Typhlomolge rathbuni, Texas blind cave salamander, USA (photo: Chip Clark). NEED PERMISSION](image3)
adaptations that different forms of cave life have made to a completely dark environment. This familiarity with the cave environment has influenced my thinking on the subject of evolution.

Many different kinds of animals have become “cave adapted”; that is, they have lost their eyes and become blind and they have lost pigment in their skin and become white (Fig. 6.4). This phenomena is called “regressive evolution” because living in a dark cave environment has caused or favored these animals to regress and lose some of their bodily features. Animals that have completely lost their pigment and eyes are called *troglobites*, or cave dwellers. In contrast, animals that are infrequent visitors to caves are called *trogloxenes*, while animals that frequently inhabit the twilight zone, and which are partly cave-adapted (e.g., small eyes), are called *troglophiles*. Typical cave-adapted troglobites are worms, millipedes, spiders, crickets, shrimp, crayfish (Fig. 6.4A), fish (Fig. 6.4B), and even amphibians (Fig. 6.4C). However, no troglobitic reptiles or mammals are known. The mechanism by which regressive evolution has occurred has been a subject of controversy from the time of discovery of blind cave animals up until the present. Regressive evolution is by no means unique to caves (e.g., loss of flight in birds in the outside world), but it is especially pronounced in this environment.

The cave environment turns out to be an advantage when trying to appraise some of the fundamental assumptions of evolution. This is because caves are simple, isolated environments where selective pressures remain relatively constant (no light, nutrient-poor, constant temperature, high moisture and relative humidity). Here are some notable characteristics of cave-adapted life:

1. In all known cases, cave-adapted species are related to surface species.
2. The time that it takes for total adaptations to be made, and for new species to emerge, can be remarkably short in some cases.
(3) The mode of regressive evolution for life in totally dark caves is almost exactly the same as it is for deep-sea creatures where there is no light (e.g., white eyeless sharks), and for creatures that burrow under ground in the dark (e.g., blind white mole rats). That is, adaptation to a no-light environment wherever it may occur results in the loss of skin pigmentation and loss of eyes, and in the acquisition of increased sensory organs such as elongated, supersensitive antennae that make up for blindness.

Although a number of different kinds of cave-adapted creatures exist, this discussion will focus on cave fish. Let’s trace what happens to a surface-stream fish species as it becomes cave-adapted. When a fish such as *Amblyopsis* regresses, it does so in stages (Fig. 6.5). The family Amblyopsidae is comprised of six species in four genera, and the whole range of cave adaptation is represented by this one single small family.\(^{35}\) *Chologaster cornutus* is the outside-world amblyopsid species. It is well pigmented and there is a longitudinal stripe along each side of the body. Its eyes are normal. As *Amblyopsis* colonizes the twilight zone of a cave, the optic lobe progressively decreases in size and the eyes become reduced, such as is the case for the troglophile *Chologaster agassizi*. Then, in the three cave-adapted troglobitic species, *subterraneous*, *spelaeus*, and *rosae*, the ocular system becomes degenerate while the number of sensory papillae increases. The loss of skin pigmentation coincides with ocular degeneration. The sequence of *Amblyopsis* shown in Figure 6.5 represents the amount of regressive evolution with respect to the length of time that generations of *Amblyopsis* have inhabited the cave environment. *Typhlichthys*, the youngest troglobite inhabitant of the three, is normally without pigment but is able to gain pigment back if kept in the light for a few months. *Amblyopsis rosae* is completely cave adapted, and when taken out of a cave it will not regain any of its original characteristics.
The sequence of adaptation as shown in Figure 6.5 documents a progressive change in gene structure and the evolution from one species to another different species. Therefore, if “after its kind” in Genesis 1 refers to separate acts of creation, such acts must be applicable on a genus, family or higher level than species, because otherwise cave-adapted species would not always correlate with their surface counterpart species. To me, this series of cave-adapted species is compelling evidence that species do evolve into other species under the right selective pressures (in this case complete darkness). Why else would there be transitional species from the surface (trogloxenes) into the twilight zone (troglophiles) and then into the completely dark cave zone (troglobites), each transition of which shows a greater adaptation to darkness?

Figure 6.5. Representatives of the family *Amblyopsidae.*

A. *Chologaster cornutus*

B. *Chologaster agassizi*

C. *Typhlichthys subterraneus*

D. *Amblyopsis spelaeus*

E. *Amblyopsis rosae*
Another important characteristic of regressive evolution is that it can happen very rapidly in small populations. For example, populations of the freshwater Mexican cave fish *Astyanax mexicanus* may have reached total cave adaptation in pigment and eyes in 10,000 years or less. Furthermore, it has been found that this process of extensive regressive evolution in *mexicanus* has occurred not just once, but independently several times when surface stream populations have become isolated in different caves. Even though it is more likely for a small isolated population to change its genetic makeup faster than a large stable population, the question can still be asked: How can the evolution of species happen so fast if speciation is dependent on purely random mutations? Biospeleologist David Culver in his book *Cave Life* states this “challenge” to traditional evolutionary explanations: “The case is difficult to explain by either selectionist or neutralist hypotheses. As far as regressive evolution being the result of the accumulation of selectively neutral mutations, the process takes too long. Any process that takes more than $10^4$ to $10^5$ generations cannot explain regressive evolution.” Culver concludes that, because of the time element, multiple mutations must be involved in regressive evolution.

Natural selection is the usual mechanism that has been invoked over the last 50 years for driving regressive evolution. A mutation that reduces a useless structure, such as an eye in a totally dark environment, will have a selective advantage because it saves energy. However, this “energy-economy” hypothesis is not universally accepted by biospeleologists because there has never been any empirical proof that there is a real energetic advantage in the elimination of structures like pigment and eyes.

The most significant question to ask regarding regressive evolution and its significance to the Theory of Evolution is: Can genetic changes in organisms be *caused by the environment itself*? *Amblyopsis* and *Astyanax* cave fish, and other organisms who live in complete darkness,
appear to have lost their pigment and eyes as a direct response to the lack of light. However, this whole line of inquiry smacks of Lamarckism – that is, the inheritance of acquired characteristics, where an animal’s use or disuse of an organ affects that organ’s development in the animal’s offspring. Lamarckism has been “out of favor” for most of the 20th Century, but in fact in the latter part of the 19th and early 20th Centuries regressive evolution seen in cave biota played an important role in the rise of neo-Lamarckian ideas.

The intriguing subject of regressive evolution brings up many questions about the process of evolution in general. If eye loss in cave fish is tied to multiple mutations, then do these have to occur simultaneously for the macroevolution of species to occur? Do genes “hitchhike” with other genes and thereby induce mutations relatively quickly? Or are “jumping genes”, which move in and out of regulatory chromosomal positions, responsible for evolutionary leaps? Is Lamarckism a mechanism by which evolution might be directed on a genetic level; that is, does the environment provide the feedback necessary for genetic change? The answers to these and other pertinent questions about evolution lies in the science of molecular biology, and it is possible that future breakthroughs in this field may finally determine if and how evolution works.

**Christian Views on Evolution**

Before we begin this section, we need to discuss what a “creationist” and “evolutionist” are, and then ask the question: Are these terms mutually exclusive? Remember from Chapter 3 that there are two Christian positions on the age of the Earth: a Young-Earth Creationist position and an Old-Earth Creationist position. To be a “creationist” does not necessarily imply that one believes that God’s creative activity was limited to a six-day period. Or, as stated by Phillip Johnson in his book *Darwin on Trial*, in the broadest sense a “creationist” is simply a person
who believes that the world was *designed* and exists for a *purpose*. An “evolutionist” can be an atheistic evolutionist who believes that the whole universe formed by *chance* via evolutionary processes (i.e., *naturalistic evolution*), or he/she can be a theistic evolutionist who believes that evolution was one way that God used to bring about the universe and life to the point where it is today.

The answer to the question: “Are the terms ‘evolutionist’ and ‘creationist’ mutually exclusive?” thus depends on if these terms are broadly or narrowly defined. The terms are mutually exclusive to many in the evangelical Christian community. If a person even so much as leans towards being an “evolutionist”, that person is automatically considered to be a non-Christian. The same narrow judgment is true of many scientists. If a person says that he or she is a “creationist”, then that person is automatically labeled as a Young Earth Creationist. In reality Christians – including evangelical Christians – hold a wide range of positions on evolution, but most of them don’t state their specific position for fear of creating division within the church or of being ostracized by other church members.

We are now going to discuss the three major positions that Christians take on evolution.

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<th>NON-CHRISTIAN</th>
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<td>Young-Earth Creationism</td>
<td>Progressive Creationism</td>
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<td>“After its kind” means that each species was created instantaneously and separately by God during the creation week of Genesis 1.</td>
<td>God has intervened in life processes by creating new species over time; then these species remain static until His next intervention.</td>
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**Young-Earth Creationism**

This is the view that “after its kind” in Genesis 1 means that God created each species separately, and that there is no evolutionary connection between different species. Rather, there
was a “fiat” creation of all species in their present form over a literal six-day period specified in Genesis 1. All species in the fossil record were formed during this original six-day creation period, but many became extinct in Noah’s Flood.

**Pros.** Many of the “pros” to this position are the same as for topics covered in previous chapters. That is, this view has been the traditional position of the church for centuries, and it wasn’t until Darwin published *The Origin of the Species* that this position was questioned. It can also be considered to be the plainest and most straightforward reading of the text if one views the phrase “after its kind” to include revelation from God concerning modern science rather than reflecting the pre-scientific worldview of the biblical author(s).

**Cons.** As also mentioned in earlier chapters, the biggest “con” to this view is that it ignores or denies the overwhelming scientific evidence that plants and animals have existed on Earth for millions of years, and that the fossil record does not support a single, worldwide, catastrophic flood (see Chapters 4 and 5). Also, this position dismisses the very strong circumstantial evidence that all life on Earth is interconnected anatomically, genetically, and geologically.

Furthermore, there is disagreement among proponents in the Young-Earth Creationist camp as to how broad a meaning the word “kind” should have. Should it be fixed at the species level or at a higher level? Many adherents now opt for creation at the level of taxonomic families that were present on Noah’s ark; then these animals somehow diverged into the species we have today in only about 5000 years. Some Young-Earth Creationists even argue that God created the “basic kinds” and then allowed for limited evolutionary meandering within these kinds. This is because the evidence, such as was exemplified in the cave-fish discussion, shows that certain species do clearly derive from other species.
**Progressive Creationism**

Progressive Creationism (also sometimes referred to as “interventionist creationism”) is the view that God has intervened in the development of life at various stages, and that there has been the miraculous creation of new species over time, especially during the “Cambrian explosion” and after major extinctions. According to this view, God created the first organisms supernaturally and He has also introduced major new types of organisms supernaturally over geologic time. A somewhat different version of this progressive creationism view is that God has divinely introduced new genetic material into life forms from time to time.\(^{40}\)

**Pros.** This is the view often held by the “Day-Age” view people discussed in Chapter 2. Its strongest “pro” is that it allows for long periods of geologic time in which animals lived and became extinct according to the fossil record. It also attempts to explain “stasis” and the sudden appearance of animals in the fossil record by attributing God with their miraculous creation, with these types then becoming “fixed” over subsequent long periods of time.

**Cons.** Like the Day-Age view itself, this position lacks empirical support. Does “new creatures” refer to species, genera, families, orders, or classes? Did these “stock” species evolutionarily branch into other species? If so, how far do evolutionary processes proceed before “new creatures” have to again be miraculously created? When and how did God interfere in life’s history? By creating the first DNA? The first cell? This view sounds like a variation on a “god-of-the-gaps” theology, where when something can’t be explained, God is envisioned as “jumping in” to do a required miracle (Fig. 6.6). But is this unexplainable gap a gap in knowledge or is this truly a gap in nature in which God intervenes?\(^{41}\) The great danger in such a theology is that it is always liable to become a casualty of further scientific advance. Over and
over in the history of science what was once attributed to God has been explained by natural processes.\textsuperscript{42}

\textbf{Figure 6.6.} The basic problem with the Progressive Creationist view. NEED PERMISSION.

\textbf{Theistic Evolution}

This view maintains that macroevolution has occurred, but that God was responsible for it. Not only did He initiate the process of evolution, but He also directs and controls it. Rather than being a random, directionless process, evolution has a purpose behind it that stems from God, with God perhaps providing the “feedback” in evolution. Usually inherent in this view is the implication that the divine act of creation was immediate and all-inclusive, with results that took time to develop (i.e., God chose process over fiat). Or, as Francis Collins has remarked in his book \textit{The Language of God},\textsuperscript{43} the book of the human genome “was written in the DNA language by which God spoke life into being.” Theistic evolution is the view of many scientists
who are Christian, especially Christian biologists and geologists. It is held by only a small minority of Protestant evangelicals, but is commonly the view of Roman Catholics and liberal Protestants.

**Pros.** The main “pro” to this position is that it satisfies the scientific requirement that all creatures are connected by descent and the biblical requirement that this descent was by divine plan. In this view, natural processes and divine action are not in competition with each other, but are complimentary. God is not only the originator of creation, but He also sustains it with the Word of His power (Heb. 1:2). What we call a natural process is not outside of His realm, but rather the universe and all living things within it have slowly evolved under God’s sovereign control. God’s biological direction includes the evolution of animal life to humans until such time as humans were capable of a relationship with God. The end result of this evolutionary process was a creature “made in God’s image” in the sense that humans have the capacity for communion and fellowship with their creator.

**Cons.** This position sounds good, but it also raises many questions. Exactly what is the interaction between God and the macroevolution of species? Did God just start life and let it “evolve” on its own? Or has He manipulated genetic material over time in some way impossible to resolve scientifically? If God let evolution run by itself, doesn’t this limit the creative activity of God? Is this view supported by the Bible, which indicates that God has intervened in His creation over time? Do humans have a distinct origin in theistic evolution, or are they but just another “let run” phenomenon? This position also has the weakness of straining Genesis 2 and 3 in terms of Adam and Eve being historical figures. Because populations – not individuals – evolve, a theistic evolution view of Adam and Eve would be that they are only symbols of the human race instead of being real people, such as maintained by the worldview approach.
A Matter of Faith

In concluding this chapter, I would like to state my personal opinion on evolution: there is very strong circumstantial evidence in favor of evolution but the working mechanisms behind it are not yet well understood. However, this situation may change as the science of molecular biology continues to unravel the dynamics of the genome. In the final analysis, whether one is a creationist or a naturalistic evolutionist is based on faith. This is true for people of both persuasions because neither position can be proved with scientific certainty. For me personally, it takes more faith to believe that all of matter in the universe, including life, came about by chance than to believe that God created and sustains it.

NOTES


The King James Version of the Bible translates the Hebrew word *tannîym* as “whale”, but other versions translate this word as “sea creature,” “sea monster” or “dragon”, implying some kind of dinasour-like reptile. Strong’s concordance translates it either way. For the purpose of this discussion, it doesn’t matter, as neither a sea mammal or sea reptile fit within the Linnean category of fish.


Such percentages vary somewhat depending on the genetic parameters chosen; see *The Language of God* by Francis S. Collins (New York, Free Press, 2006) 126-129.


