CHAPTER THIRTEEN

The Fossil Record Part 2
One-Celled Organisms Through Birds

In the last chapter we saw that creation and evolution each led us to make five major predictions about the fossil record.

Visual #13-1

EVOLUTION PREDICTS:	**CREATION PREDICTS:**
I. Uniformitarianism	I. Catastrophism
II. Poorly Defined Communities	II. Ecological Communities
III. Gradually Increasing Number of Higher Taxa	III. Large Number of Higher Taxa at the beginning, decreasing through time
IV. Gradual Appearance of New Types	IV. Sudden Appearance
V. Unlimited Directional Change	V. Stasis (Resistance to Basic Change)

We saw that the fossil record shows clear evidence of: (I) Catastrophism and (II) Ecological Communities. Creation wins easily on these two points, calling into question the evolutionary time scale of billions of years. There is no compelling reason to believe that the earth is extremely old. In fact, there is no scientific reason that it has to be more than a few thousand years old.

Visual #13-2

About 95% of the fossils known are shallow water sea creatures such as corals and shellfish. Of the other five percent, 95% are algae, plants, and invertebrates. This means that only about ¼ of 1% of the fossils are vertebrates (Lacey and Foley, 2018).

Visual #13-3

We have seen that much of the geologic record suggests catastrophic deposition under flood conditions rather than gradual accumulation over billions of years. We also saw that each rock layer is identified by a characteristic suite of fossils, which creationists believe represents a specific community of animals and plants known as a *biome*.

Visual #13-4

The usual arrangement of the geologic column makes it look as if the simplest organisms are on the bottom, then gradually increase in complexity as they evolve toward the top. This is not the case.

Visual #13-5

- Precambrian, Cambrian, Ordovician, and Silurian rocks (lower Paleozoic) contain exclusively marine creatures. Each of these biomes seem to be well suited to a shallower and shallower depth in the ocean, with all the associated circumstances such as amount of light.
- The Devonian contains mostly sea creatures, but also has a relatively small number of land animals and plants. Creationists believe the land plants were washed in by the violent action of the Flood. The land invertebrates are primarily insects and arachnids (e.g., spiders) but also include amphibians. This is what we would expect for a biome close to sea level.
- Pennsylvanian and Mississippian (Carboniferous) strata are known for a large number of plants, e.g., ferns. They also contain a relatively small number of shallow-water animals.

Later in this chapter, we will fill in some of the details of these biomes. When we get to reptiles, we will present a creationist interpretation of the upper Paleozoic and Mesozoic layers from Permian through Cretaceous.

The next few chapters will occasionally refer to the evolutionary terminology of "early" and "late." It will be apparent that even if the earth were billions of years old, creation would still be correct on the remaining three predictions. The fossil record fits with all the predictions of creation but often contradicts those of evolution.

Visual #13-6

The next several chapters will deal with the remaining three predictions of each model together rather than separately: (III) Initial Number of Higher Taxa, (IV) Sudden vs. Gradual Appearance, and (V) Stasis vs. Continual Change. In these areas, too, creation is much more plausible than

Visual #13-7

evolution. The fossil record shows that from the very beginning, every kind of living thing appeared in clearly defined groups that have remained distinct throughout their history. Fossils furnish the most devastating evidence against gradual evolution (initial disorganization) and some of the best evidence for special creation (initial complexity).

I. THE GAP FROM NON-LIFE TO LIFE.

Visual #13-8

Earlier, we examined the possibility that life could have come into existence from nonlife under ideal circumstances. We saw that several conditions would have been necessary.

(1) Despite the evidence from geology, the earth would have had to have an atmosphere almost completely devoid of oxygen.

(2) There would have had to be some unknown mechanism to filter out the sun's deadly UV radiation despite the absence of an ozone layer.

Visual #13-9

(3) In order for amino acids to form as postulated in the Oparin-Haldane hypothesis, there would have had to be a significant amount of ammonia (NH_3) in the atmosphere. This compound is the starting point for the amine group in amino acids. However, in order for large enough quantities of ammonia to be available to make the amino acids, the process of *nitrogen fixation* would have to occur on a large scale.

Atmospheric nitrogen occurs in the form of N_2 molecules. Fixation occurs when the two nitrogen atoms are separated, which makes them available to join other atoms to form compounds such as NH_3. In order for this to happen in the atmosphere, a large amount of pure hydrogen would have to be mixing with the nitrogen so as to be available to react. However, elemental hydrogen is the lightest gas and easily escapes into space. There is no known mechanism to keep it here long enough to participate in the process of fixation.

This is not a problem in the modern world because living things already contain vast numbers of amino acids which are used over and over whenever anything eats anything else. In addition, bacteria and some plants perform the process of nitrogen fixation on a large scale. However, those same bacteria and plants are made of amino acids. Until the first bacteria were producing fixated nitrogen compounds, there would be no amino acids to form the bacteria themselves.

It is true that lightning can cause nitrogen fixation, but this happens only on a small scale. The early earth would have required a far higher concentration of fixated nitrogen than lightning can produce in order for even the simplest amino acids to come into existence. Besides the theoretical problems, there is no geologic record of such an atmosphere. In addition, the lightning scenario would have eliminated any other possible energy sources such as UV, heat, impact, and the like.

(4) Despite the fact that the hypothetical "primordial soup" required to form life would have had to cover the earth for perhaps millions of years, there is no known trace of its existence anywhere.

(5) According to evolution, the earliest cells would have had to form proteins and other cell structures from the elements available (CHNOPS, Ca, Na, Cl, and so on), but they would not yet have had a mechanism to reproduce themselves. There was no DNA available to carry genetic information from one generation to the next.

In order for these hypothetical cells were to reproduce, they would first have had to acquire something similar to RNA, which then gradually evolved into DNA through countless generations. However, every living thing known uses DNA to carry genetic information. There is not a single known type of organism that passes on its information by RNA alone.

(6) Cells are very complex, falling into two basic types: *prokaryotes* (no membrane around the nucleus) and *eukaryotes* (fully formed membrane). No known living or fossil organisms show a partially developed nuclear membrane. In every case ever observed, it is either fully formed or fully absent.

No one knows what the first cell from which we all evolved (also known as LUCA, or the **L**ast **U**niversal **C**ommon **A**ncestor) might have been. We have no fossil evidence that it ever existed. Even the simplest known living or fossilized cells are far more complex than it would have been. Thus, we cannot trace the evolution of a **single kind** of organism, living or extinct, animal or plant or anything else, or from the hypothetical first cell.

Visual #13-10

Just how simple is a one-celled organism? A typical single-celled bacterium, *Escherichia coli* (*E. coli* for short), is estimated to contain about as much information as 100 million *Encyclopedia Britannica*-sized pages (Sagan, 1973b). This is roughly one-tenth the amount of information contained in the entire New York Public Library, concentrated into a single microscopic organism. There is no known living or fossil organism showing the gradual development of all this genetic information.

Thermodynamics and biology show us that this much information simply does not come together by itself. To anyone who has not already decided to rule out God, a reasonable conclusion is that life began by a direct creative act.

II. PLANTS and Photosynthesis.

Evolution leads us to believe that the first plants were extremely simple cells. However, plants, whether fossil or living, are anything but simple.

A cell is composed of a great many amino acids linked into thousands of different kinds of proteins, which are in turn linked together into cell structures and enclosed in a membrane or wall. The cell builds itself up and reproduces according to the information in its DNA, which contains sugars, bases, and phosphates. Thus, it needs amino acids, proteins, sugars, bases, and phosphates in order to grow and reproduce. It may obtain these by eating other cells as animals (*heterotrophs*) do, or it may manufacture them itself as many plants (*autotrophs*) do. There are two reasons why early plants would have had to manufacture their own components:

Visual #13-11

- Even if we accept the evolutionary time scale, there is no evidence that the materials necessary to manufacture the substances above were available from the early earth's environment. We have never found any traces of a "primordial soup." If it existed, there was not enough of it to furnish the raw materials needed for early life to spread over the planet.
- Since early cells would have been extremely few in number, not many would have been available as food for others.

Visual #13-12

Every known living thing requires at least the elements Carbon, Hydrogen, Nitrogen, Oxygen, Phosphorus, and Sulfur (CHNOPS). The earliest plants would presumably have manufactured their components the same way modern plants do, by the process of *photosynthesis*. The fossil record bears this out: the oldest plants known, blue-green algae, are found in strata evolutionists date about 3.5 billion years, just a few hundred million years younger than life itself. These algae are photosynthetic. This means that the element Magnesium had to be present also.

Visual #13-13

AN EVOLUTIONARY ENIGMA: EARLIEST LIFE FOUND AT THE BOTTOM OF THE SEA. Darwin believed that life must have begun in some "warm little pond" as a result of chemicals assembling themselves using energy from the environment. Other evolutionists later speculated that this energy might have been in the form of electricity, light, impact, short-wave UV, or heat. In any case, the "warm little pond" scenario means that life would have had to come into existence at or above sea level because ponds cannot exist underwater. However, the "oldest" forms of life known are Precambrian animals and plants, which would have lived at the very bottom of the ocean. How, then, could the first living things have gone from sea level to the bottom of the ocean?

- Did they dive all those miles down?
- Or did they begin at the bottom? In this case, none of the hypothetical energy sources above would have been available except volcanic heat, which with very rare exceptions kills things instead of making them come alive.

Visual #13-14

Back to photosynthesis: The proteins in plants and animals are thermodynamically unfavorable molecules that do not come together spontaneously, yet they are necessary for life to exist. Animals get proteins from organisms lower on the food chain. They break these down into amino acids and reassemble them into the types of proteins they need. Though there may be intermediate organisms, the amino acids in these proteins ultimately come from plants.

Plants are able to manufacture amino acids, sugars, and so on because the mechanism of

photosynthesis is programmed in their DNA. This process uses at least a hundred types of specialized enzymes (Allen & Martin, 2007) to manufacture amino acids and proteins from scratch, one atom at a time. The plants take in various molecules from air, water, and soil, then rely on the enzymes to extract needed atoms such as carbon, hydrogen, nitrogen, phosphorous, and oxygen. They release the rest as waste. (For example, plants use the carbon in carbon dioxide and release the excess oxygen into the atmosphere.) Sunlight powers the process.

Visual #13-15

Photosynthesis takes place in a part of the cell known as the *chloroplast*. This consists of *grana*, drum-shaped cylindrical bodies linked in chains. Each of these consists of a stack of about a dozen disk-shaped envelopes. Each envelope contains a crystalline arrangement of chlorophyll molecules and is so small that it can only be seen when magnified hundreds of thousands of times by an electron microscope. The process that goes on inside a chlorophyll molecule is not fully understood, but it works in the same way as the circuitry of sophisticated electronic equipment (Pfeiffer, 1964). So far, scientists' best efforts at harnessing the power of sunlight in photoelectric devices have achieved an efficiency of less than 28 percent, though some unverified claims go as high as about 40 percent. Compare this to plants, which are at least 85 percent efficient (Payne et al., 1992), perhaps more. Is this an accident of evolution?

Chlorophyll consists of carbon, nitrogen, hydrogen, oxygen, and magnesium. Magnesium is not part of the "primordial soup" in origin-of-life experiments. How it could have become an essential part of the earliest cells remains a mystery. So does the origin of photosynthesis.

To summarize: there is no such thing as a simple plant, no matter how old it is claimed to be.

III. THE GAP FROM ONE-CELLED TO MULTI-CELLED.

Visual #13-16

- Many organisms consist of a single cell that has to perform all the necessary functions of life. Even if they live in colonies, each cell has to take care of all its own needs.
- Every other living thing consists of anywhere from tens of thousands to trillions of specialized cells, each of which performs specific functions needed by the organism – heart cells, eye cells, skin cells, and so on. No one cell does everything. All the cells have the same DNA, but only certain functions are switched on in each one.

If evolution is correct, we would expect to find living things progressing from one-celled to two-celled, three-celled, four-celled, and so on as their cells began to assume specialized functions. We have never found such organisms. A sharply defined gap exists between single-celled creatures (*Protozoa*) and the far more complex multi-celled creatures (*Metazoa*), both in the fossil record (Dobzhansky et al., 1977) and in the modern world. There are no known living or fossilized creatures made up of gradually increasing numbers of cells, nor are there any where the cells gradually assume different functions.

This flies in the face of both atheistic and theistic evolution. Whether God or Random Chance was responsible, simple cells would have had to evolve through greater and greater numbers of cells until they turned into complex multi-celled creatures. Those who believe in evolution must do so purely by faith, in opposition to the evidence.

IV. THE EDIACARAN FAUNA - COMPLEX INVERTEBRATES.

Visual #13-17

While the vast majority of fossil-bearing rocks are assigned an age of Cambrian or later, Pre-Cambrian rocks do contain a few types of fossils. However, none of these are considered ancestral to Cambrian or later fauna. In recent years a Pre-Cambrian suite known as the Ediacaran Fauna (after the Ediacara Hills of Australia, where it was first discovered) has been found on five different continents. It consists of complex invertebrates such as unusual types of corals, jellyfish, and segmented worms. Harvard's Stephen Jay Gould, a vocal anti-creationist, nevertheless tells us that they are not ancestors of later corals, jellyfish, or worms (Gould, 1984). He points out a number of significant anatomical differences between later specimens and their Ediacaran counterparts.

Visual #13-18

- ***Jellyfish.***

  Living jellyfish have a ring of concentric muscles at the outer edge of the bell-shaped part

of their bodies, which they contract in order to move. The radial feeding grooves lie toward the center of these concentric muscles. The Ediacaran jellyfish have a reversed arrangement: the concentric muscles surround the inner parts, and the radial grooves are on the outside. The kinds of mutations that would be needed for their anatomy to undergo such a radical reversal rule them out as ancestral jellyfish.

These creatures destroy the argument that the ancestors of the Cambrian fauna were not preserved because they were soft-bodied invertebrates. Few things are softer than a jellyfish.

- ***Corals.***

The corals look superficially like modern soft corals, yet are significantly different. The modern variety has separate branches which allow water to reach the individual members of the colony in order to bring oxygen and nutrients. Their Ediacaran counterparts form a continuous quilted structure, not separate branches. Thus, the mechanism for supplying oxygen and nutrition to individual members of the colony is radically different.

- ***Worms.***

The Ediacaran worms, while segmented and symmetrical like many worms from other geologic "ages," are flat rather than round. Gould tells us that like the corals and jellyfish, they are simply too different from their modern counterparts to be plausible ancestors.

The Ediacaran animals are regarded as evolutionary dead ends that became extinct without leaving descendants. Yet they are soft-bodied invertebrates such as the Cambrian creatures' ancestors would have had to be, and are perfectly preserved. So now evolutionists have two mysteries:

(1) Why were the Ediacaran fossils preserved while their contemporaries, the unknown ancestors of the Cambrian, were not?

(2) Where are the ancestors of the Ediacaran Fauna? They are complex invertebrates themselves and would also have had to evolve over millions of years.

To creationists, the Ediacaran Fauna sound like an ecological community. They have nothing to do with the Cambrian Explosion.

V. SUDDEN APPEARANCE OF MANY HIGHER TAXA - THE CAMBRIAN EXPLOSION.

CLADISTICS VS. THE LINNAEAN SYSTEM OF CLASSIFICATION.

Visual #13-19

The classification system used throughout this book is the Linnaean system (named after the naturalist Linnaeus) that classifies living things according to Kingdom, Phylum, Class, Order, Family, Genus, and Species. Each level is called a *taxon* (plural *taxa)*.

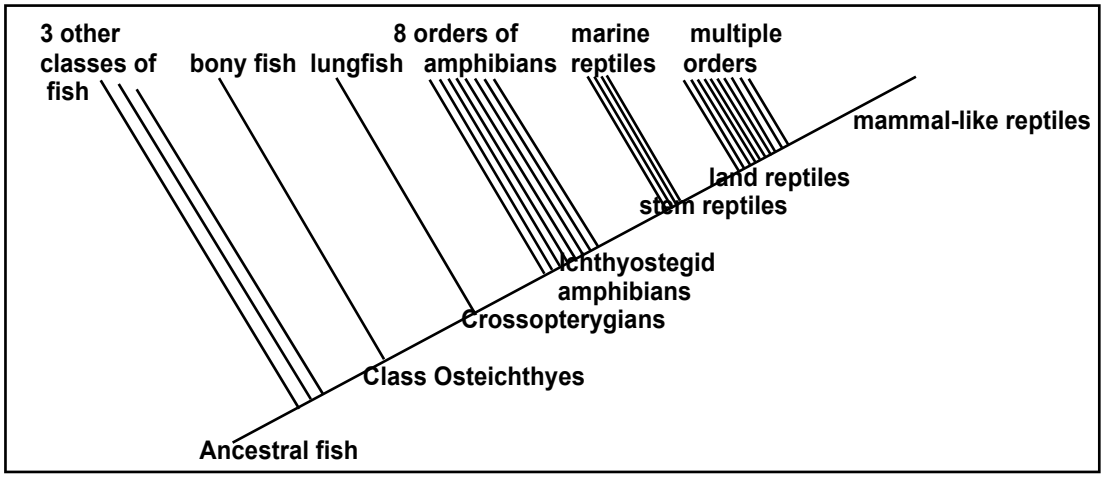
In the last few decades more and more biologists, paleontologists, and textbook authors have shifted to a different system known as phylogenetics or cladistics. This system takes for granted that the diversity of animals and plants is due to evolution. Diagrams look much like trees, with everything being related to everything else. The groups that are considered to be the closest relatives are placed closer on the trees. For example, everything that has any kind of nerve column along its back would be grouped together; within that group, everything that has a backbone; within that one, everything that has teeth; within that one, everything that has a certain type of teeth, and so on.

Visual #13-20

The alleged relationships between groups are presented in diagrams known as cladograms. As an example of a cladogram, shown is a simplified version of how fish are supposed to have evolved into amphibians, which then evolved into reptiles, and so on. There need not be any known transitional forms in order to produce cladograms such as the one below, which are used to claim evolutionary relationships in science textbooks.

In this cladogram, some unknown type of ancestral fish is supposed to have given rise to all the known classes of fish including jawless, armored, cartilaginous, and bony forms. The latter, Class Osteichthyes, included a group of fish known as crossopterygians and others known as lungfish. One of these types is supposed to have evolved into amphib-

ians. The amphibians in turn evolved into many other types of amphibians as well as "stem reptiles." The stem reptiles are then supposed to have given rise to multiple types of marine and land reptiles, and so on. These later produced mammals, including humans.



To reiterate, cladists do not necessarily group organisms by traditional classes or orders, but instead according to how they are believed to be related in evolutionary terms.

Visual #13-21

Pre-Cambrian times are supposed to have lasted almost four billion years. Though every type of living thing should have been going through thousands or millions of evolutionary stages during that time, the Pre-Cambrian fossil record consists mainly of blue-green algae, disputed "microorganisms" which may not be traces of living creatures at all, and the complex invertebrates of the Ediacaran fauna.

Visual #13-22

Suddenly in the Cambrian, representatives of *all the phyla* of the animal kingdom, as well as many divisions of plants, appeared fully formed with all their ordinal characters - those things which identify a snail as a snail, a fish as a fish, etc. – clearly defined. (As we would expect for an ocean bottom biome, they include only marine life.) The Cambrian fauna are quite complex, even including at least one type of vertebrates, fish of **Class Agnatha** (Repetski, 1978; Shu et al., 2003).

In evolutionary terms, the origin of this vast array of Cambrian creatures is a mystery. No known transitional forms lead up to them from any Pre-Cambrian organisms, despite a supposed three billion years of evolution. Their sudden appearance is so dramatic that geologists call this the "Cambrian Explosion."

Visual #13-23

If we look in the modern oceans we find a great deal of diversity. However, the variety of marine creatures today pales in comparison to the variety found in the Cambrian Explosion, the vast majority of which later became extinct. This is exactly the opposite of what evolution leads us to expect, but it is precisely what creation predicts: a great many higher taxa appear suddenly and explosively without known ancestry, then later become extinct.

Why is there no fossil record of ancestors to the Cambrian fossils? The most obvious explanation is that they did not exist. Evolutionists cannot accept this. Instead, they say that the Pre-Cambrian strata must have been unsuitable to preserve fossils.

Geology and paleontology tell us otherwise. Sections of sedimentary rock over 5,000 feet thick are found directly under the Cambrian stratum, blending smoothly into it. These rocks are chemically identical to the Cambrian rocks, yet they contain no ancestors for the Cambrian creatures (Axelrod, 1958). Perhaps the climate, not the rocks, was unsuitable for preserving fossils? Unfortunately for evolutionists, the Ediacaran jellyfish show us that this is not the case either. If the conditions were suitable to preserve some- thing as soft as jellyfish, they would have been suitable for just about anything else too.

Creationists have a different interpretation of the Cambrian Explosion. Recognizing that all these fossils are buried in water-deposited sediment, we believe that they do not show the sud-

den development of so many types. Instead, we think it makes more sense that these animals and plants were buried together at the lowest level because they were bottom-dwelling sea creatures. Thus, they would have been among the first to be buried in the sediments of Noah's Flood. At any rate, evolution is nowhere to be seen.

Visual #13-24

So far we see that the fossil record shows us: (I) Catastrophism, (II) Ecological Communities, and (III) Explosive Appearance of Higher Taxa. The first three predictions of creation are correct, while those of evolution are exactly the opposite of what we observe in nature.

Now let us examine the idea that organisms evolved over billions of years from one simple cell to more and more complex forms. We will see that every major group of fossils appears suddenly and fully formed, and that no major group shows any directional change throughout its entire history, whether until extinction or until the present.

VI. SUDDEN APPEARANCE OF PLANTS.

Visual #13-25

All the animals found so far in the Cambrian Explosion have been types one would expect to find living in the sea. This is not the case with Cambrian plants. Land plants (lycopsids and sphenopsids) are not supposed to have evolved until the Devonian (Weisz & Fuller, 1962), yet fossils of over sixty genera of land plants have been found in Early Cambrian deposits around the Baltic region of Europe (Axelrod, 1959; Weier et al., 1974). S. Leclerq (1956) reported the discovery of traces of land plants in Middle Cambrian deposits of Siberia, and P.K. Strother (2000) reported finding spores of land plants in Cambrian rocks at the Grand Canyon. This is a hundred million years too early! Evolutionists have no explanation but must simply make up stories or else ignore the evidence. Creationists, on the other hand, believe that the fossils of the land plants were mixed into the marine sediments by the churning action of the Flood.

Visual #13-26

Remember that blue-green algae supposed to be 3.5 billion years old are identical to modern stromatolites. Likewise, oak, willow, magnolia, sassafras, palms, and other modern plants are found side by side with dinosaur fossils in Cretaceous rocks, supposed to be at least sixty-three million years old (Morris & Parker, 1982). It seems that plants forgot to evolve.

E.J.H. Corner, a professor of botany at Cambridge University, says that textbooks "hoodwink the reader." Even though he believes in evolution, he states that "to the unprejudiced, the fossil record of plants is in favor of special creation" (Corner, 1961). Prof. C.A. Arnold of the University of Michigan, also an evolutionist, tells us that we cannot trace the evolution of a *single group* of plants from its beginning to the present (Arnold, 1947).

VII. "EARLY" INVERTEBRATES.

Depending on who is doing the classifying, the animal kingdom is usually divided into between twenty-three and thirty-six phyla. Only one phylum, **Chordata**, includes vertebrates in the sub-phylum **Vertebrata**. The rest are all invertebrates (no backbone).

There are several commonly used invertebrate classification systems. The one below is found on www.fossilmuseum.net.

Visual #13-27

Phylum **Annelida** - earthworms, leeches, marine worms
Phylum **Arthropoda** - most common
  Class **Arachnida** - spiders
  Class **Crustacea** - shrimp, crabs, lobsters, barnacles
  Class **Insecta**
  These three classes are all arthropods – animals with jointed legs and exoskeletons.
  Class **Trilobita**
Phylum **Brachiopoda** – shelled organisms with left-right symmetry across their shells.
Phylum **Bryozoa** – tiny filter-feeding colonial organisms
Phylum **Cnidaria** - corals, jellyfish, anemones
Phylum **Ctenophora** - comb jellies
Phylum **Echinodermata**
  Class **Crinoidea** – sometimes known as sea lilies.

Class **Echinoidea** – sea urchins and sand dollars, which wander around the seafloor, most-commonly eating sediment or plant material. They have five-fold symmetry.

Phylum **Mollusca**

Class **Bivalvia** – common shelled organisms like clams, oysters, and mussels. Generally filter feeders; live in or on top of seafloor sediments. Common today, but less common further back in geologic time. Difference from brachiopods is that symmetry is between the top and bottom shells.

Class **Gastropoda** – marine or terrestrial snails with three-dimensional coiled shells. Include both herbivores and carnivores.

Class **Cephalopoda** – Cephalopods, squids

Phylum **Nematoda** or **Aschelminthes** - roundworms

Phylum **Nemertea** - ribbon worms

Phylum **Platyhelminthes** - flatworms

Phylum **Porifera** - sponges

The vast majority of invertebrates fall into eight phyla: **Annelida**, **Arthropoda**, **Cnidaria**, **Echinodermata**, **Mollusca**, **Nematoda**, **Porifera**, and **Platyhelminthes** (http://www. fossil-museum.net/Tree_of_Life/ Kingdom_animalia/animalphyla.htm). Each of these phyla is separated from the others by a clearly defined gap. Not a single one has any known ancestors (Thompson, 1943).

A. PHYLUM ARTHROPODA

The invertebrates that are probably most familiar to us are the arthropods. These include trilobites, insects, spiders, and crustaceans.

1. TRILOBITES.

Visual #13-28

Trilobites received their name because their bodies were divided into three side-by-side (not front to rear) lobes. Though they all seem to be extinct, they were some of the most common fossils in Cambrian through Permian rocks and comprised thousands of named species. The number may be inflated because at least some of the trilobites went through multiple stages of life and shed a different looking exoskeleton at each stage of growth. Since we cannot do breeding experiments on extinct animals, we cannot tell if the fossils all represent different species or variations within a number of major groups.

Visual #13-29

Since trilobites include some of the major index fossils for the "earlier" periods, they should be low on the evolutionary ladder. However, from their very first appearance they are quite complex. While some seem to have been mud-dwellers with no eyes, the vast majority had one of three distinct types of eyes, all of which are more complex than those of any later arthropods (Morris & Parker, 1982; Sunderland, 1984). The most common, *holochroal*, had up to 15,000 tiny hexagonal crystalline lenses all in contact with each other, under a single corneal layer. These multifaceted eyes did such a good job of correcting for distortion that it was not until the 1700s that the physicists Descartes and Huygens were able to work out the mathematics of the holochroal lens. (Gon, 2007)

2. ANIMALS OF THE LOWER PALEOZOIC (CAMBRIAN, ORDOVICIAN, SILURIAN)

Visual #13-30

Trilobites are found not only in the Cambrian, but also in the Ordovician,. Silurian, and Devonian. All the various types found in each layer appear suddenly and fully formed with no known ancestry.

Visual #13-31

In addition to trilobites, the Ordovician suite of fossils includes many types that would be well suited to slightly shallower depths than those of the Cambrian. These included crinoids, corals, brachiopods (similar to clams), nautiloids, graptolites, and starfish, among many others. Though many of them are similar to forms from the Cam-

brian, they are not believed to be descendants. No evolution here.

Visual #13-32

Likewise, the Silurian (known as the "age of reefs") contains a suite of fossilized animals and plants that would have thrived at at shallower depths, just below sea level. They included many types of corals, echinoderms (animals with multiple arms radiating outward symmetrically) crinoids, mollusks, sea scorpions, starfish, graptolites (tiny animals that lived in branched colonies), nautiloids, fish, and large reefs.

Visual #13-33

There is no evolutionary progression to be seen as we move up through the Paleozoic strata. Trilobites disappear above the Permian layer with no known descendants. All the rest of the animals and plants either continue to the present, or disappear at specific levels which creationists believe correspond to their biomes.

Visual #13-34

No evolution here!

3. INSECTS, SPIDERS, AND CRUSTACEANS.

Visual #13-35

Insects are probably the best known arthropods. They appear and become extinct in various strata through out the geologic column, but no two kinds are connected by any transitional forms. Each type appears suddenly and fully formed, "rather like Pallas-Athene who sprang fully formed from the head of her father Zeus" (Wootton, 1984). The first insect known is *Rhyniognatha hirsti*, found in the early Devonian and dated about 400 MYA (millions of years ago) (Engel and Grimaldi, 2004). Though there has been diversification and extinction, insects have not exhibited any directional change since then.

Cockroaches, dragonflies, bees are all are essentially the same in the present as they were when they first appeared in the fossil record (Farber, 1983; Brues, 1951; Boyden, 1973). It seems that arthropods, like plants, forgot to evolve.

The winged insects are of two types: **Paleoptera** (wings held aloft at rest), and **Neoptera** (wings held to the side at rest). Not only is there no known transitional form connecting these two radically different types, there is no known transition connecting them to wingless insects (Hoyle, 1983).

The total absence of ancestors and transitions cannot be blamed on a poor fossil record. At least forty thousand fossil species of insects and spiders have been identified, not to mention the sea-dwelling arthropods. Surely at least one transition should have been preserved along with these tens of thousands of terminal species! Creationists would say that we have no transitional forms because none ever existed. We might ask those who staunchly defend theistic evolution: *If God used evolution, where is the evidence?*

B. ECHINODERMS, CRINOIDS, BRACHIOPODS, ETC.

Visual #13-36

Another very well known phylum found in the lowest fossil-bearing layers is **Phylum Echinodermata**. The name means "spiny-skinned. The echinoderms are marine animals with an exoskeleton made of spines or plates. They include such types as crinoids, starfish, sand dollars, and sea urchins.

Class Crinoidea includes marine animals commonly known as "sea lilies." They could easily be mistaken for plants. In many ways they are like starfish, but they belong to an entirely different class. Crinoids crawl across the sea floor using their feather-like tentacles, which they also use to capture small bits of floating food. Most have a stem which can attach to the bottom or can be used to feed.

The lowest appearance of crinoids is in the Ordovician, dated 488 MYA, though some scientists say that the first one was *Echmatocrinus,* found in the Burgess Shale and dated 500 MYA (https://www.fossilera.com/pages/about-crinoids). Though there are several hypotheses as to their origin, there are no transitional forms leading up to their sudden appearance in the Ordovician. Like every other known type of fossil, they appear suddenly and fully formed with all their ordinal characters intact.

Phylum Brachiopoda. Brachiopods are animals with two shells of unequal size, and a ribbon like extension which they use to feed. Each type appears in the fossil record sud-

denly and fully formed. No evolution is apparent between their lowest and highest appearance in the fossil record.

This is just a representative sample of the gaps in the supposed evolutionary history of life. Remember that one of the predictions of creation is that many higher taxa (kingdom, phylum, class, order) should appear suddenly and fully formed in the lowest fossil-bearing layers. This is not limited to the highest categories. Even at the lower taxonomic levels of family and genus, not a single transitional specimen has ever been found demonstrating the evolution of any type of organism from one group to another. Every group appears explosively and fully formed in the fossil record.

Visual #13-37

There is a vast amount of evidence to back this statement up. As we continue to look at the testimony of the fossils (remember, we've unearthed at least hundreds of billions so far), we'll see just how true it is.

VIII. THE FIRST VERTEBRATES.

While there are far fewer kinds of vertebrates than of invertebrates, they are especially important to us humans for two reasons:

Visual #13-38

- We ourselves are classified as vertebrates. If we evolved, some of the lower vertebrates are our ancestors.
- As more "recent" creatures, the vertebrates should have a fairly good fossil record. (Remember the Karoo Formation with its estimated 800 billion vertebrates.)

Evolutionists estimate that it would have taken a hundred million years for some invertebrate group to evolve into vertebrates. Which group? Nobody knows. Some think we evolved from something like a segmented worm that might have been similar to annelids. However, of the hundreds of billions of fossils unearthed so far, not a single one shows any intermediate stages between invertebrates and invertebrates (Ommaney, 1964, 60; Romer, 1966, 54). At least three genera of jawless fish, *Haikouichthys* (Shu *et al*., 2003), *Myllokunmingia* (Holland and Chen, 2001), and *Anatolepsis* (Repetski, 1978), belonging to **Class Agnatha**, appear in the Cambrian fossil record suddenly and fully formed.

This is no trivial problem. The evolution of all higher creatures depends on the change from invertebrate to vertebrate. But none of the "earliest" vertebrates, the four fish-type classes of vertebrates (**Agnatha**, **Placodermi**, **Chondrichthyes**, and **Osteichthyes**) have any known ancestors. All appear suddenly and fully formed.

Visual #13-39

A. CLASS AGNATHA.

There is no known connection between **Class Agnatha** (jawless fishes) and the three "more advanced" classes, all of which have jaws (Romer, 1971, 42).

B. CLASS PLACODERMI.

This class consists of especially odd fish which Alfred S. Romer of Harvard describes as "wildly impossible." They have neither plausible ancestors nor plausible descendants (Romer, 1971, 24-33).

C. CLASS CHONDRICHTHYES.

This class includes the sharks. Since their bodies are more "primitive" than most other fish, they should have evolved first. However, they appear out of evolutionary sequence. They are among the *last* fish to appear in the fossil record. Their ancestors are unknown (Romer, 1971, 34-38). Remember, too, that sharks have about a billion more nucleotides in their DNA than we humans do! Who is more evolved, us or sharks?

D. CLASS OSTEICHTHYES.

This class consists of the "higher" bony fish. It is especially important to the creation/evolution controversy because it includes crossopterygian fish, from which all land animals are supposed to have evolved. The ancestors of this class are unknown. The first representatives of **Osteichthyes** are easily recognizable as members of either **Subclass Actinopterygii**, the ray-finned fishes, or **Sarcopterygii**, the fleshy-finned ones (Romer, 1971, 52-53).

Despite what textbooks and the media tell us, evolutionists have no idea where any of the fishes came from. Errol White, a specialist in lungfishes, admitted in his Presidential Address to the Linnaean Society of London that the lungfishes, like every other major group of fishes, had their origins firmly based in nothing. He confessed that he had often thought how little he should like to have to prove evolution in a court of law (White, 1966, 8). Unfortunately, students in school do not have the same protection from half-truths and outright lies they would in court. They are told over and over that evolution is "proven scientific fact."

Evolutionists try to trivialize the transition from invertebrate to vertebrate, saying that it is obvious that vertebrates came from a segmented worm or some similar animal. The process supposedly took a hundred million years of evolution, but there is not a single fossil to show for it. Is this really proven scientific fact?

IX. FISH TO AMPHIBIAN.

Visual #13-40

Life is supposed to have begun in the water and remained there for perhaps three billion years. Eventually, though, fish had to come out of the water in order to evolve into amphibians, reptiles, birds, and mammals. The transition is supposed to have taken place during the Devonian as a group of fish known as crossopterygians (**Class Osteichthyes**) evolved into the amphibian order **Ichthyostegalia** (**Class Amphibia**). Some specimens in this group of fish do show a certain amount of superficial similarity to some of the amphibians. Superficial resemblance is not enough.

Textbooks tell students that natural selection pressure forced these fish to evolve into amphibians. The story says that the amphibians' fish ancestors lived in fresh water during times of periodic drought. Because of random mutations in their DNA, some acquired fins that were stronger than those of their relatives. As the lakes dried up, the fish with stronger fins were able to drag themselves to other bodies of water while those without the improved fins died. The process repeated as more mutations occurred. Gradually, the fins developed into legs. Finally, amphibians appeared.

At first glance, this sounds plausible. However, even the slightest amount of examination shows that it is not.

A. PROPOSED TRANSITIONS.

If fish came out of the water, there had to be forms intermediate between them and the amphibians they were evolving into.

1. COELACANTHS (Order Crossopterygii, or in some systems, Superorder Crossopterygii, Order Actinistia.)

The modern fish closest in structure to crossopterygians are the coelacanths. They were thought to be extinct for over 60 million years until the first specimen (genus *Latimeria*), was caught off the coast of Madagascar in 1938. Many have now been caught or observed by means of deep-sea submersibles. They have not evolved. They are virtually identical to their fossil counterparts.

Direct observations have falsified many of the made-up stories about the crossopterygians.

a. Function of the "Lungs."

The "lungs" are actually swim bladders which the fish can inflate or deflate to adjust its buoyancy, like the ballast tanks on a submarine. They can inflate them with gases from the blood, or reabsorb the gases back into the blood. They have nothing to do with breathing.

b. Use of Fins.

Scientists have used deep-sea submarines to observe coelacanths in their native habitat. They never use their fins for anything like crawling or walking, even on the sea bottom.

c. Native Habitat.

Unlike the hypothetical transitional forms in the past, coelacanths live in the deep ocean, not at sea level. No droughts, not even those supposed to have taken place in the Devonian, are serious to dry up hundreds of feet of ocean.

2. LUNGFISH (Order Dipnoi).

Visual #13-41

Lungfish belong to different group of lobe-finned fish than coelacanths. All of the Devonian lungfish, e.g., *Dipterus* and *Uranolophus*, are believed to be extinct. The modern types live in shallow waters in Africa, South America, and Australia. Though they are not as similar to *Eusthenopteron* as coelacanths are, some evolutionists believe that lungfish are a more likely candidate for the transition to land.

- Modern lungfish live in shallow water.
- Their lungs function as swim bladders but also allow the fish to store oxygen. Australian lungfish can breathe either by using their gills or by swimming to the surface and gulping air. African lungfish bury themselves in mud during the dry season and can live up to a year breathing by means of their lungs. South American lungfish (also called American mud fish) breathe through gills as larvae, but rely on their lungs as adults.
- The fins are sometimes used for slithering through mud, though the fish move them in a very different fashion from any known animal that walks.

3. MAJOR ANATOMICAL DIFFERENCES BETWEEN FISH AND AMPHIBIANS.

There are major anatomical problems with both the crossopterygians and the lungfish as possible ancestors.

a. The Notochord (precursor to Backbone).

Visual #13-42

All vertebrates begin their embryonic development with a notochord, a flexible rod of cells supporting the body. Eventually, the notochord of almost all vertebrates – including amphibians (Annona et al., 2015) – is replaced by a segmented spine. Afterward, the notochord remains only in the form of the cartilaginous substance between the vertebrae.

Coelacanths and lungfish are exceptions to this rule. They never acquire a segmented backbone but retain an uninterrupted notochord throughout their lives (Reynolds, 1897, 66, 70; Bates, 2015; Redmer, 2020; Schmitz, 1998).

Animals do not grow notochords or backbones because they need them, but because their DNA contains the instructions to produce them. In order for either the coelacanths or the lungfish to be the ancestor of amphibians, their DNA would have to undergo a great many mutations. These would have to make it through the previously described error correcting mechanisms so as to eventually produce a segmented backbone instead of an uninterrupted notochord, in addition to all the other differences seen below.

Visual #13-43

Though one could insist that such changes are possible, they are not supported by evidence.

b. Shoulder (pectoral) and hip (pelvic) bone structures.

- A few types of amphibians such as some extinct aistopods and living caecilians do not have legs. However, all those that do possess legs have pectoral and pelvic girdles rigidly attached to the backbone on one end and to the legs on the other. Fish fins, on the other hand, are loosely embedded in muscle. No known living or fossil fish has a pelvic girdle or any intermediate structures showing how one might have gradually developed.
- Since most of a fish's weight is supported by water, its fins do not experience much stress when it rests on the bottom. If it came out of the water it would be subject to much greater forces. The fins, the muscles supporting them, and the backbone would all have to be strong enough to bear the full weight.

Visual #13-44

- Fish propel themselves mainly through motion of the body and tail, with the fins used primarily for balance and steering. In amphibians the main source of propulsion is the legs (Clack, 2012, 51-52). Legs are supposed to be derived from fins, rather than the body and tail.

c. Skull and Head features.

Visual #13-45

- The skull of the amphibian would no longer be supported by water so the muscles that support it would need to be much stronger.
- There are different numbers of bones in the skull of amphibians and fish, and a difference in their sizes and arrangement. (Colbert, 1980, 75)
- The pectoral girdle of fish (analogous to shoulders) is attached directly to the skull. In amphibians, it is attached to the vertebral column (Benton, 2005, 77). This allows amphibians to have necks, whereas fish do not.
- The eyes would have to change to work primarily in air instead of water. Eyelids and tear glands would be needed to prevent drying when out of the water.
- Fish do not have eardrums; ichthyostegids did. (Colbert, 1980, 90)

d. Breathing and circulatory systems.

- The breathing apparatus is significantly different in the two categories. With the exception of adult South American lungfish, even the fish that are able to survive in air primarily breathe in water. On the other hand, larval amphibians breathe through gills. Once they mature they breathe primarily through lungs, though some are also able to breathe directly through their skin.
- The circulatory system is different.

e. Method of Fertilization.

Many creatures reproduce by internal fertilization, in which the sperm of the male is deposited inside the body of the female. Many others use external fertilization, in which the female deposits her eggs than the male comes by and sprays his sperm on them.

i. Internal.

Since we know from direct observation that living lungfish and coelacanths use internal fertilization (Anthony & Millot, 2017) it seems most likely that the other crossopterygian fish also used the internal method (Clack, 2012, 62).

ii. External.

Except for caecilians (snakelike forms with no legs), amphibians rely on external fertilization (Duellman & Trueb, 1994, 77–79). In order for fish to evolve into amphibians, identical mutations in DNA would have had to produce all the above changes in both a male and a female, while simultaneous non-identical mutations would have had to produce complementary changes in their reproductive systems. Instead of keeping her eggs inside, the female would have had to expel them into the environment. Meanwhile, instead of seeking copulation with a female, the male had to begin to spray his sperm on the eggs.

In order for the species to survive, this would either have had to happen to a great many individual males and females at the same time and place, or to one extraordinarily fortunate pair who happened to have exactly the correct matching mutations. It would have to happen not just for one species, but for every one of the new types of amphibian.

f. Metamorphosis.

Visual #13-46

Most people are familiar with tadpoles, which are the immature larvae of frogs. Though frogs may be the most familiar amphibians, most of the other types (except newts) also go through the process of metamorphosis in which the animal undergoes a complete change from the larval to the adult form.

A group of Paleozoic amphibians known as labyrinthodonts include the only

forms similar to fish. Thus, they are the only candidates for the ancestors of all the other amphibians. At least some of the labyrinthodonts underwent enough metamorphosis from larvae to adults that the larvae were incorrectly placed into a new subclass, Phyllospondyli (Romer, 1966, 90-92; Case, 1946, 325-420; Colbert, 1980, 99). If the amphibians evolved from some sort of fish, the process of metamorphosis that led to the misclassification must have had its source in the DNA of their fish ancestors.

As noted, the hypothetical ancestors of amphibians were either crossopterygians or lungfish.

i. Absence of metamorphosis in either crossopterygians or lungfish.

Some of the extinct *Eusthenopteron* specimens were over a meter long, or about 3 and a half feet. Though we do not have any living individuals of this type to study, scientists have been able to analyze hundreds of fossils as small as 27 mm (about an inch) and have not found even a single specimen going through a larval stage (Cote et al., 2002, 488, 501). As for living coelacanths and lungfish, none have ever been seen going through any form of metamorphosis.

ii. Metamorphosis in other non-crossopterygian fish.

Though non-crossopterygian fish are not believed to have anything to do with the evolution of amphibians, for the sake of completeness we will include those that go through varying degrees of metamorphosis.

aa. Subclass Actinopterygii ("ray-finned fish").

Most of the familiar modern fish such as trout, bass, and catfish belong to this subclass. Some of them do undergo a greater or lesser degree of metamorphosis, but they are not considered ancestors or close relatives of amphibians. Several examples:

- Several types of eels undergo a gradual yet radical metamorphosis, going through as many as five stages of development over several years. However, eels are not considered ancestors of amphibians because (1) they are of the wrong subclass and (2) they first appear in the Cretaceous, at least a hundred fifty million years too late.
- In the young of **flatfish** such as flounders and halibut, the eyes are on opposite sides of the head. The animal experiences a partial metamorphosis in which the head changes shape so that both eyes end up on the same side. Though the body also changes shape, the animal maintains its overall fishy appearance the whole time.
- **Salmon** undergo a partial metamorphosis as they change from being suited for fresh to salt water. However, there is not much change in shape.

In most other bony fish, the only thing that could be considered metamorphosis is that they absorb the yolk sac while they are developing.

ab. Class Agnatha (jawless fish).

One group of agnathans, the lampreys, have skeletons made of cartilage rather than bone. They undergo partial metamorphosis in which their bodies become longer, their eyes develop, and their dorsal fins separate into two sections. However, they maintain the same overall eel-like appearance from hatching until death.

To summarize: None of the fish supposed to be ancestors or relatives of amphibians go through metamorphosis, yet most amphibians do.

Visual #13-47

It would be difficult for periodic droughts to produce all the mutations needed to bring about the above anatomical features, method of reproduction, and metamorphosis that transformed fish into amphibians. Initial Disorganization leads us to believe that the mutations and the transitional forms carrying them have simply not yet been dis-

covered. Initial Complexity says that the features of fish and amphibians are the products of information placed into their DNA in a fully functional condition.

B. UNKNOWN ORIGIN OF EIGHT OTHER AMPHIBIAN ORDERS.

Visual #13-48

Class Amphibia is divided into three subclasses, each containing three orders. The three orders living today all belong to the same subclass. The other six first appeared in Paleozoic rocks and are believed to be extinct.

All nine orders are supposed to be descended from the same fish-to-amphibian ancestor. Because **Order Ichthyostegalia** most closely resembles the hypothetical transitional form, it is supposed to be the oldest amphibian group and perhaps the ancestor of the others. However, the story of amphibian evolution is very fishy.

1. STRUCTURAL DIFFERENCES BETWEEN FISH AND AMPHIBIANS.

a. As we will see below, some types of amphibians belonging to **Orders Aistopoda** and **Nectridea** had no legs at all.

b. Animals with legs have a pelvic girdle to which the legs are rigidly attached; fish fins are loosely embedded in muscle. No known living or fossil fish has a pelvic girdle, but all animals with legs do. No one has ever found any living or fossilized creatures with intermediate structures.

c. Fish and amphibians have many other differences besides fins and legs. The skull, circulatory system, eyes, ears, and breathing apparatus are significantly different in the two categories.

2. EXTINCT AMPHIBIANS.

a. Subclass Labyrinthodontia included:

i. **Order Ichthyostegalia** (Devonian through Mississippian, up to ten feet long, somewhat crocodilian in overall shape). This order included the genera *Seymouria* and *Diadectes*, whose significance we will discuss in section IX-A.

ii. **Order Temnospondyli** (Mississippian through Triassic), water-dwellers with flat bodies and small limbs;

iii. **Order Anthracosauria**, supposed to be the ancestors of reptiles.

All three orders had the same "arch-type" vertebrae as reptiles. Contrary to evolutionary expectations, the other two subclasses are considered degenerate from Ichthyostegalia rather than more complex. Evolution would have had to take one step forward and two steps back.

b. Subclass Lepospondyli (early Mississippian to Permian) included:

i. **Order Aistopoda**, long snakelike forms with up to 200 vertebrae. Most had no limbs and no pelvic girdle.

ii. **Order Nectridea** also included some forms with no legs.

iii. **Order Microsauria**, small amphibians.

All three of these orders had a fundamentally different type of vertebra, lepospondylous or "husk-type." This type of vertebra is not found in any class other than amphibians. It is considered much more primitive than the arch-type vertebra of many other vertebrates.

Visual #13-49

Though there is no fossil evidence for a transition, let's suppose for the sake of argument that **Order Ichthyostegalia** came from fish. After all, this group contained at least one genus that had some similarities to the crossopterygian fish *Eusthenopteron*.

Then where did the other five Paleozoic orders come from? Some had no legs at all, some had hundreds of vertebrae of a radically different type, and all had major internal differences from fish. How could natural selection due to drought cause the DNA of five other orders to evolve so differently from that of the ichthyostegids?

3. LIVING AMPHIBIANS.

a. Subclass Lissamphibia includes:

i. **Order Urodela** or **Caudata**, salamanders and newts.

ii. **Order Apoda** or **Caecilia**, worm-like with no limbs.

iii. **Order Anura** or **Salientia**, frogs and toads. These have a long history, with the first frog fossils found in supposedly 245 million year old Permian rocks in Madagascar (Cogger, 1999, 28).

These three surviving orders all have the "more primitive" lepospondylous vertebrae rather than the arch-type vertebrae supposed to link crossopterygians with the ancient ichthyostegids.

No known forms connect the six Paleozoic orders with the three modern ones. Nothing in their structure indicates where they came from (Romer, 1971, 52-55 & 403; Gish, 1985, 73-76). Since the transition from fish to amphibian is supposed to have taken place only once and since the Paleozoic orders had the "more advanced" type of vertebrae, where did the modern orders get their "primitive" backbones? It would require many steps backwards for evolution.

C. FIRST APPEARANCE OF ICHTHYOSTEGID AMPHIBIANS.

Ichthyostegid amphibians first appeared in the Devonian. If they evolved because of droughts, we should see mass extinctions of freshwater fish. However, the Devonian is known as the "Age of Fishes" because so many new kinds of fish appeared, and afterward are found in many higher strata (interpreted as geologic ages).

D. ABSENCE OF INTERMEDIATES.

Despite imaginative drawings of intermediate forms in textbooks, no one has ever discovered a real transition. We have thousands of fossils of crossopterygian fish and ichthyostegid amphibians, but not a single fossil of anything with structures intermediate between fins and legs. There is no evidence that any such creature ever existed.

E. SUPPOSED TRANSITION (TIKTAALIK) OUT OF SEQUENCE.

Visual #13-50

A fossil fish known as *Tiktaalik*, dated about 383 MYA, has been proposed as a transition between fish and amphibians because it had some characteristics that seem similar to amphibians. However, it is far out of evolutionary sequence. *Tiktaalik* is dated about 383 MYA but tracks of four-legged creatures (obviously land animals) dated to 395 MYA have been found in the Holy Cross Mountains in Poland. On the evolutionary time scale, this is about 12 million years before *Tiktaalik*, ruling it out as the ancestor of amphibians. (Niedzwiedzki et al., 2010)

In summary, there is no positive evidence that amphibians evolved from fish, and a great deal of evidence against it. If our first single-celled ancestor really did evolve from chemicals in the primordial ocean, we should still be swimming there too.

X. AMPHIBIANS TO REPTILES.

The next stage of evolution would have required amphibians to become less dependent upon the water as they developed into reptiles.

A. DIFFERENT EGG TYPES.

Visual #13-51

The skeletal differences between reptiles and some of the labyrinthodont amphibians are so minor that it is difficult to determine whether a fossil was a reptile or amphibian based on bones alone. The major feature that enables us to distinguish between the two groups is the type of egg from which each hatches: Amphibians have a "simple" gelatinous egg which must incubate in water, while reptiles have a complex amniotic egg (similar to that of a bird) which must incubate in air.

No known living or fossilized creatures have any type of in between egg. It is difficult to imagine how such a transformation could have taken place, especially since baby amphibians breathe through gills but baby reptiles breathe air. If the first amphibians evolving

into reptiles laid their eggs in the water as all amphibians do, the babies would have drowned as soon as they hatched. There would have had to be two sets of perfectly coordinated mutations in the DNA of the evolving animals. (Irreducible complexity again!) As one set produced the new type of egg, the other set had to give the mothers the instinct to crawl out of the water and lay the eggs on land.

Visual #13-52

B. FOSSILS OUT OF SEQUENCE.

Visual #13-53

Reptiles are supposed to have evolved from some sort of amphibian such as a temnospondyl, an anthracosaur, or something similar.

It is easy to tell larval amphibians and reptiles apart since the former are aquatic and the latter are terrestrial. Once the amphibians reach the adult stage, though, some of their skeletons are so similar to reptiles that it is difficult to tell them apart. Such was the case with *Seymouria* and *Diadectes*. The former was thought to likely be a reptile until larvae of *Discosauriscus*, considered to be a close relative, were discovered with gills (Clack, 2012, 355; Romer, 1996, 95). Since no known reptiles go through an aquatic stage, *Discosauriscus* is an undisputed amphibian. And since *Seymouria* is considered a close relative, it is also believed to have been an amphibian.

Diadectes is accepted by most as a very early reptile despite the fact that we have not found either eggs or larvae. Its skeleton is very similar to that of *Seymouria*, though there is a significant difference in size. The largest known specimens of *Seymouria* were about two feet (600 mm) long (Benton, 2005, 110), whereas *Diadectes* was up to ten feet (Romer, 1966, 97). However, *Diadectes* appears too late in the fossil record to be the first reptile.

- The commonly accepted age of its alleged ancestor *Seymouria* is in the early Permian, about 280-270 million years ago (MA).
- *Diadectes*, supposed to be the descendant of *Seymouria*, is also dated to the early Permian, about 290 MA. Few authorities pay attention to the fact that this is about ten million years too early.
- The earliest undisputed reptile is *Hylonomus*, dated about 315 MA (early Pennsylvanian). This predates the supposed amphibian ancestor of reptiles, *Seymouria*, by about 35 million years and the reptile supposed to have evolved from it, *Diadectes*, by about 25 million years.

One could make an argument that perhaps the dating is wrong. If so, how can we be certain that any other dates are correct?

XI. CLASSIFICATION OF REPTILES.

Recall that there are two major systems for classifying living things. The Linnaean (taxonomic) system groups them by their characteristics. The other, Phylogenetics, groups them by their supposed evolutionary history. This, of course, presupposes that they really did evolve.

This book uses the Linnaean system. Since almost all textbooks assume that evolution occurred and thus use phylogenetic charts, it is difficult to find an up to date Linnaean chart. Following is Uetz's 2002 version, which divides **Class Reptilia** into 7 subclasses and 18 orders. A plus sign indicates the groups believed to be extinct. (The genus *Saltoposuchus* is mentioned because it is supposed to have special evolutionary significance.)

Visual #13-54

CLASS REPTILIA (Uetz, 2002)

A. **SUBCLASS ANAPSIDA** (box-like skull without openings near temples except eye sockets)

1. **Order Cotylosauria** ("stem reptiles" of late Paleozoic and Triassic) (+)
2. **Order Chelonia (Testudinata)** (turtles)

B. **SUBCLASS LEPIDOSAURIA**

1. **Order Eosuchia** (Permian and Triassic diapsids - 2 openings in temple on either side of skull in addition to eye sockets) (+)
2. **Order Rhynchocephalia** (living New Zealand sphenodon and similar fossil forms)
3. **Order Squamata** (lizards, snakes)

C. **SUBCLASS ARCHOSAURIA** ("ruling reptiles" - diapsids, two openings in temple on either side of skull in addition to eye sockets)
1. **Order Thecodontia** (Triassic - supposed to be ancestors of birds and dinosaurs) (+)
a. **Suborder Pseudosuchia**
i. Genus *Saltoposuchus*
2. **Order Crocodylia** (crocodiles, alligators)
3. **Order Pterosauria** (extinct flying reptiles with membrane wings) (+)
4. **Order Ornithischia** (dinosaurs with birdlike pelvis radiating in four directions) (+)
5. **Order Saurischia** (dinosaurs with lizard-like pelvis radiating in three directions) (+)

D. **SUBCLASS EURYAPSIDA** (synaptosauria, one opening high on skull) (+)
1. **Order Sauropterygia** (plesiosaurs - marine Mesozoic reptiles with paddle-like limbs) (+)
2. **Order Protorosauria** (+)

E. **SUBCLASS SYNAPSIDA** ("mammal-like," one opening on each side of temple in addition to eye socket) (+)
1. **Order Pelycosauria** ("primitive" Permian mammal-like reptiles) (+)
2. **Order Therapsida** ("advanced" late Permian and Triassic) (+)
3. **Order Mesosauria** (+)

D. **SUBCLASS PARAPSIDA** (+)
1. **Order Ichthyosauria** (+) (fish-like, highly specialized for marine life)

E. **SUBCLASS ARAEOSCELIDA** (obscure Permian and Mesozoic reptiles)
1. **Order Trilophosauria** (+)
2. **Order Weigeltisauria** (+)

A. FOSSILS OUT OF EVOLUTIONARY SEQUENCE

Visual #13-55

Fish should have evolved to amphibians, then amphibians to "stem reptiles" from which the other reptiles evolved, then to somewhat more advanced reptiles, then to the most advanced mammal-like reptiles of subclass **Synapsida**, and finally to the even more advanced mammals. However, the fossils show us a different picture. The time periods when this supposedly happened are as follows:

Devonian	380 - 370 MYA	Crossopterygian fish to ichthyostegid amphibians. Too late! The "earliest" amphibians *Ichthyostega* and *Acanthostega* are found in the Devonian around 370 MYA, but tracks of four limbed animals have been found in the Holy Cross Mountains of Hungary, dated 395 MYA, about 12 million years **before** the supposed fish-to-amphibian transition *Tiktaalik*.
Pennsylvanian	315 MYA	*Hylonomus* - "stem reptile." Also mammal-like reptiles **Pelycosauria** and **Therapsida**, considered **most advanced** reptiles.
Permian	225 MYA	*Seymouria* supposed to be ancestor of *Diadectes,* supposed to be transition to **first** reptiles. However, "first" reptile *Hylonomus* dated 35 to 45 million years **before** *Seymouria.*
Triassic	190 MYA	First undisputed mammals - **before** "more primitive" dinosaurs such as *Herrerasaurus.* Evolutionists say this was the beginning of dinosaur times, not the end. Mammal-like reptiles become extinct, mammals almost completely absent for 100 million years.
Jurassic	136 MYA	A few mammals, lots of reptiles
Cretaceous	64 MYA	A few mammals, lots of reptiles

Visual #13-56

As previously noted, *Seymouria* and *Diadectes* arrived millions of years too late to be the ancestors of the reptiles.

There are no transitional forms leading to from **Class Reptilia** to **Class Mammalia**. Evo-

lutionists must simply rely on faith in what might be discovered in the future.

B. DIFFERENCES BETWEEN MAMMAL-LIKE REPTILES AND MAMMALS

Visual #13-57

There are hundreds of thousands or millions of fossils of extinct "mammal-like" reptiles, though the term "mammal-like" is seldom used any more. It indicates types that had some features more like mammals than other reptiles. These included tooth arrangement, lower jaw and middle ear structure, and the number of openings in the skull. The mammal-like reptiles are now classified as *synapsids* (one opening in the skull behind and below the eye) along with mammals because both groups have similar skull structures. Thus, evolutionists often call living reptiles non-mammalian synapsids.

1. TYPES OF "MAMMAL-LIKE REPTILES"

a. Pelycosaurs.

Pelycosaurs are synapsids but not mammals. They are found in the middle Pennsylvanian to middle Permian. The lowest pelycosaur in the fossil record, *Ophiacodon*, is commonly dated about 306-280 MA. The one found at the highest level, an unnamed specimen known as SAM-PK-K10407, is dated ca 260 MA (Modesto et al., 2011, 1027-1029).

Pelycosaurs appear suddenly in the Permian with no known ancestry. They are not considered to be ancestors of mammals, but instead a side branch of reptiles (a *sister taxon*) that became extinct at the end of the Permian (Jehle, 2006). They disappear with no known descendants.

b. Therapsids.

Most who follow the evolutionary idea of cladistics believe all the synapsids (mammals, pelycosaurs, and an overlapping "sister group" of the pelycosaurs called therapsids) evolved from a common ancestor despite their many differences.

Therapsids are known for having legs placed under the body rather than sprawled out to the side as in non-therapsids.

> Many dinosaurs had a similar leg arrangement, but they had *diapsid* skulls (two openings behind the eye on each side).

The most complete record of therapsids is from the Karoo Supergroup of South Africa, dated from the middle Permian to early Jurassic (Abdala et al., 2019) and estimated to contain billions of vertebrate fossils. The oldest therapsid is thought to be *Tetraceratops*, identified on the basis of a single crushed skull (Spindler, 2020), commonly dated about 280 MA. The last non-mammalian therapsids are dated to around the beginning of the Cretaceous. Though they are alleged to be the ancestors of more advanced reptiles and of mammals, no specific transitional forms have been proposed to connect them to those groups.

c. Non-mammalian Cynodonts.

Cladists place mammals and some types of therapsid reptiles in a smaller group known as cynodonts. These have "dog-like" teeth, contrasted to non-cynodonts such as the gorgonian *Lycaenops* that had teeth better suited to shearing.

Many cynodonts are found throughout the Permian, especially in the Karoo of South Africa. Those considered to be the oldest are non-mammalian types (usually called reptiles in the past) such as *Charassognathus* and *Procynosuchus*, found in Paleozoic strata dated to the later Permian (Abdala et al., 2019). The uppermost known non-mammalian cynodonts, *Scalenodontoides* and *Elliotherium*, are found in Mesozoic strata of the upper Triassic.

> The meaning of the suites of fossils used to identify rock strata is a matter of interpretation. Initial Disorganization automatically assumes that these characteristic assemblages developed over millions of years, whereas Initial Complexity allows for the possibility that they represent ecological communities.

2. MAJOR DIFFERENCES BETWEEN "MAMMAL-LIKE REPTILES" AND MAMMALS.

We need to look at anatomical details to find out just how mammal-like these reptiles were. Though there is a certain amount of external similarity between their fossils and the body structures of some mammals, there are significant internal differences.

a. Jaw structure.

Visual #13-58

The jaw structure of mammals and reptiles is radically different. All living and fossilized mammals ever observed have a single bone (the dentary) on each side of the lower jaw and three ear bones (auditory ossicles) on each side. All living and fossilized reptiles ever observed have three bones on each side of the lower jaw and only one ear bone on each side (Gish, 1985, 95-96). Remember, these bones are present because they are programmed in the animal's DNA.

Several genera such as *Morganucodon* (also called *Eozostrodon*), *Liaoconodon*, and *Brasilodon* have been proposed as possible transitions between reptiles and mammals. These are not typical mammal-like reptiles and will be considered in the next chapter. There is not a universal agreement as to whether they were reptiles, mammal, or transitional forms. Nevertheless, within the mammal-like reptiles, there is not a gradual progression from the typical reptilian arrangement to the typical mammalian structure.

b. Middle ear structure.

The ear structure of mammals is different from that of any other group. One of the most significant differences is the Organ of Corti, a spiraling apparatus only 3 millimeters in diameter in the inner ear containing 20,000 rods and 30,000 nerve endings. No living or fossilized reptile has any structure from which this fantastically complex mechanism could possibly have developed. Since reptiles apparently hear as well as we do, there would be no evolutionary advantage in developing such an organ (Hitching, 1982, 90-91). What would cause the precise mutations in DNA needed to produce such an intricate structure? And why would natural selection favor something that gave no advantage?

c. Breathing mechanism.

The thoracic girdle of mammals (part of the chest cavity) is fundamentally different from that of reptiles. In mammals it is expandable and is separated from the abdomen by the diaphragm. In reptiles the fore part of the thorax is rigid and there is no diaphragm. Thus, the two classes breathe differently. There is no structure in any reptile, living or fossilized, from which the diaphragm could have evolved (Gish, 1985, 102) while maintaining at least minimal function. The mutating animals would have died at birth.

d. Eye placement.

The eyes of mammals and reptiles are placed differently. Mammal-like reptiles had the typical reptilian arrangement of eyes on opposite sides of the head (Miller, 1978, 218).

e. Cold-bloodedness.

All known mammals are warm-blooded, maintaining a fairly constant body temperature regardless of the environment. Despite recent speculation about dinosaurs, all known reptiles are cold-blooded: their body temperature matches their surroundings. No transitional forms are known.

f. Scales vs. hair.

Reptiles have scales or smooth skin. Mammals have at least a small amount of hair.

g. Similarity to adults.

As a miniature version of the adult, a baby reptile needs no special care. From the time it hatches, it can eat the same things an adult can. A baby mammal is much

different from an adult and requires a special diet.

h. Continual growth.

Reptiles grow as long as they live, subject to two limitations:

- Capacity to Eat. An extremely large animal would have a hard time eating enough to maintain its size, let alone grow even larger.
- Ability to Move. Very heavy animals would have a hard time moving from place to place in order to find food.

Unlike living reptiles, mammal-like reptiles had legs positioned directly underneath the body. This would have enabled them to carry more weight and grow larger than most modern reptiles.

In contrast to reptiles, mammals reach a maximum size and stop growing. Something in our DNA limits our bodies to a certain size. If we evolved from mammal-like reptiles, we should keep growing as long as we live.

i. Structures unique to mammal-like reptiles. .

Mammal-like reptiles possess some unique structures which have no reasonable analogy among any known living or fossil creatures (Kemp, 1982b, 9). They are not plausible ancestors of anything other than themselves.

These are just a few of the major differences between mammals and reptiles. Despite the superficial similarities of the body types, the mammal-like reptiles were not so mammal-like after all. Nor are they considered ancestors of other types of reptiles such as dinosaurs.

XII. DINOSAURS AND OTHER EXTINCT REPTILES.

Visual #13-59

Students, moviegoers, museum visitors, and even fast-food restaurant patrons are bombarded with pictures, models, and descriptions of dinosaurs. The reconstructions of these creatures start with the physical structure of bones, but then we put the bones together and make up stories about where they came from, how they acted, and why they disappeared. Most of the articles, books, and movies about them are based on the assumption that dinosaurs appeared through the process of evolution.

Visual #13-60

Visual #13-61

Some questions that commonly arise about dinosaurs are: What were they? (and what were they NOT?) How many types of dinosaurs were there? Were they all savage predators? Where did they come from? How long ago did they live? What made them become extinct? Are any still alive today?

THINGS THAT WERE NOT DINOSAURS:

A. MARINE REPTILES OF ORDERS ICHTHYOSAURIA, SAUROPTERYGIA, AND SQUAMOSA.

Visual #13-62

As far as we know, all the dinosaurs lived on land. However, three orders of marine reptiles (ichthyosaurs, sauropterygians, and mosasaurs) are often mistakenly called marine dinosaurs because they are supposed to have lived and died at the same time as the land dinosaurs.

1. ICHTHYOSAURIA.

Bones show us that ichthyosaurs were fish-like in structure. This has interesting evolutionary implications. Evolution is supposed to proceed toward increased complexity as higher and higher life forms develop. Yet here we have an order that went from "simple" sea animals to "more complex" land-dwellers and back again. Natural selection operated on random mutations to make some sort of fish come out of the water and develop all the new features that now identified them as amphibians. Once firmly established on land they experienced more mutations and natural selection, gaining even more new features and developing into reptiles. Then, through mutation and natural selection once again, they lost the legs they had acquired, went back to fins, and went back into the water. Their bodies again became well suited for aquatic life - all by accident.

2. SAUROPTERYGIA.

Sauropterygians had fat bodies, short tails, and paddle-shaped limbs, rather like what

we picture the supposed "Loch Ness Monster" to be.

3. SQUAMOSA.

The mosasaurs were long and snakelike, with webbed feet. (Feet, not fins!) They ranged from about 10 – 50 feet long. Their overall shape was somewhat like the legendary "sea serpents."

None of these groups is regarded as a transitional form between fish and reptiles. Instead, evolutionists consider them as degenerate forms that returned to the water.

Recall that the Lamarckian idea of use and disuse of body parts has been ruled out as a mechanism for introducing new structures. Mutations have to be responsible. There would have had to be a series of at least thousands of beneficial mutations, each building on all the previous ones, at the right place and at the right time. (Remember the illustration of a groundhog trying to cross a thousand lane highway?) The entire process did not leave a single fossil of any of the intermediate steps, but it left many fossils of the terminal forms. Evolutionists believe the scenario of sea-to-land-to-sea not because of evidence, but because they refuse to accept the possibility that these animals were created to function best in a watery environment.

B. FLYING REPTILES OF ORDER PTEROSAURIA.

A group of seemingly extinct reptiles are often mistakenly called "flying dinosaurs." One of the subclasses of **Class Reptilia** was **Subclass Archosauria**, which included five orders. Only two of these were dinosaurs. A different order, **Pterosauria**, included two major groups of flying reptiles.

Visual #13-63

- Rhamphorynchoids (long tails) belonged to four families found in Triassic and Jurassic rocks, and
- Pterodactyloids (short tails) belonged to 12 known families, found in Jurassic and Cretaceous rocks.

Nobody knows where the flying reptiles came from. They appear in the fossil record suddenly and fully formed. One genus, *Pteranodon*, had a wing span of up to fifty-two feet. There are no transitional forms showing a gradual increase to this size.

Pterosaurs are not considered as possible ancestors to birds because they had the wrong type of pelvis.

C. OTHER NON-DINOSAUR ORDERS IN SUBCLASS ARCHOSAURIA.

Visual #13-64

Subclass Archosauria included the pterosaurs, the two dinosaur orders **Saurischia** and **Ornithischia**, and orders **Crocodilia**, **Thecodontia**, and **Pterosauria**.

1. ORDER CROCODILIA.

This order contains the only known living specimens of **Subclass Archosauria**: crocodiles, alligators, and the like.

2. ORDER THECODONTIA.

For lack of a better candidate, **Order Thecodontia** is usually considered the ancestor of the other four orders of archosaurs. However, it is not connected to any of the others by any known fossil forms (Cox, 1976, 314; Romer, 1966, 140). Its appearance in the Triassic is sudden and without known ancestors. It is supposed to be the ancestor of all the other archosaurs, but it has no ancestry itself. Nor does it have any proven descendants.

XIII. TRUE DINOSAURS - ORDERS SAURISCHIA and ORNITHISCHIA.

The dinosaurs belonged to a subgroup of Reptilia called **Subclass Archosauria** ("ruling reptiles"). We are sure that they were reptiles because of their jaw structure. Other members of this subclass included the aforementioned **Crocodilia**, **Thecodontia**, and **Pterosauria**.

Visual #13-65

Within the archosaurs, the dinosaurs were members either of **Order Saurischia** ("lizard-hipped") or **Order Ornithischia** ("bird-hipped"). Some were as small as a chicken; others were the largest creatures that ever lived on land. They included the genera shown in the following chart, and perhaps many others not yet discovered.

Visual #13-66

A. WHAT WERE DINOSAURS? (Benton, 1984; Gish, 1985; Romer, 1971; Bakker, 1992, 36-39) Since we are unable to examine living dinosaurs, we must rely on the fragmentary evidence of fossils to draw conclusions about them. As a result, the actual number of dinosaur types is uncertain. Below is a typical list compiled from multiple sources.

1. ORDER SAURISCHIA.

These "lizard-hipped" dinosaurs had a pelvis radiating in three directions with pubis bones projecting forward from the point of attachment of the leg. This arrangement allowed a heavy body to be supported well in front of the pelvis.

a. **Suborder Sauropodomorpha** (large plant-eaters)

Infraorder Prosauropoda

Genera *Ammosaurus, Anchisaurus, Euskelosaurus, Ischisaurus, Lufengosaurus, Massopondylus, Melanorosaurus, Mussaurus, Plateosaurus, Staurikosaurus, Thecodontosaurus, Vulcanodon*

Infraorder Sauropoda

Genera *Alamosaurus, Antarctosaurus, Apatosaurus (mistakenly known as Brontosaurus), Barapsaurus, Barosaurus, Brachiosaurus, Camarasaurus, Cetiosaurus, Dicraeosaurus, Diplodocus, Euhelops, Hypselosaurus, Mamenchisaurus, Nemegtosaurus, Opisthocoelicaudia, Pelorosaurus, Rhoetosaurus, Saltasaurus, "Supersaurus," Titanosaurus, "Ultrasaurus"*

b. **Suborder Theropoda**

Infraorder Coelurosauria (3-6 foot plant eaters)

Genera *Coelophysis, Coelosaurus, Compsognathus, Halticosaurus, Ornitholestes, Procompsognathus, Saltopus, Segisaurus, Syntarsus, Podokesaurus*

Infraorder Ornithomimosauria ("bird-mimics")

Genera *Avimimus, Elaphrosaurus, Gallimimus, Ornithomimus, Oviraptor, Struthiomimus*

Infraorder Deinonychosauria

Genera *Deinocheirus, Deinonychus, Dromaeosaurus, Itemirus, Noasaurus, Saurornithoids, Stenonychosaurus, Therizinosaurus, Velociraptor*

Infraorder Segnosauria

Genus *Segnosaurus*

Infraorder Carnosauria (supposed to be meat-eaters)

Genera *Acrocanthosaurus, Albertosaurus, Allosaurus, Carcharodontosaurus, Ceratosaurus, Daspletosaurus, Dilophosaurus, Dryptosaurus, Megalosaurus, Nanotyrannus, Spinosaurus, Tarbosaurus, Tyrannosaurus*

2. ORDER ORNITHISCHIA.

The "bird-hipped" ornithischians had a pelvis radiating in four different directions (top front, bottom front, top rear, bottom rear), with the pubis bones pointing rearward. This allowed the digestive area to be located between the hind legs, making it much easier to stand upright. The lower jaws of ornithischians also had an extra bone, the predentary, not found in the saurischians (Dixon, 1988, 14-15).

a. **Suborder Ankylosauria** (armored)

Genera *Acanthopolis, Ankylosaurus, Dyoplosaurus, Hylaeosaurus, Nodosaurus, Panoplosaurus, Pinacosaurus, Silvisaurus, Struthiosaurus*

b. **Suborder Ceratopsia** (horned)

Genera *Anchiceratops, Bagaceratops, Brachyceratops, Chasmosaurus, Leptoceratops, Microceratops, Monoclonius, Pachyrhinosaurus, Pentaceratops, Protoceratops, Psittacosaurus, Styracosaurus, Torosaurus, Triceratops, Centrosaurus*

c. **Suborder Stegosauria**

Genera *Stegosaurus, Dacentrurus, Dravidosaurus, Kentrosaurus, Lexovisaurus, Scelidosaurus*

d. **Suborder Ornithopoda** (hadrosaurs)

Genera *Anatosaurus, Brachylophosaurus, Camptosaurus, Claosaurus, Corythosaurus, Dryosaurus, Edmontosaurus, Fabrosaurus, Geranosaurus, Hadrosaurus, Heterodontosaurus, Hypacrosaurus, Hypsilophodon, Iguanodon, Lambeosaurus, Lycorhinus, Maiasaura, Muttaburrasaurus, Othnielia, Ouranosaurus, Parasaurolophus, Parksosaurus, Prosaurolophus, Saurolophus, Scutellosaurus, Secernosaurus, Shantungosaurus, Trachodon, Troodon, Tsintaosaurus, Zephyrosaurus*

B. WHEN DID DINOSAURS LIVE?

Visual #13-67

There is a stark disagreement between evolutionists and Biblical creationists. Remember that evolutionists believe the strata represent successive time periods, whereas creationists believe they represent ecological communities (biomes).

Visual #13-68

The lowest stratum known to contain dinosaurs is the Upper Triassic. They are also found in Lower, Middle, and Upper Jurassic and Lower and Upper Cretaceous. Though some types are found in more than one stratum, there is no evolution from one layer to another; instead, there are six distinct biomes containing dinosaurs.

C. HOW MANY TYPES OF DINOSAURS WERE THERE?

Visual #13-69

There may have been hundreds of genera of dinosaurs. It is difficult to tell the exact number for several reasons:

- Many genera are known only from fragments. Complete skeletons are rare.
- Despite the "Flintstones" TV show, there was no such thing as a *Brontosaurus*. Paleontologists gave this name to a fossil only to learn that it had been discovered earlier and was already named *Apatosaurus*. Since so many finds are fragmentary, this may have happened with other types as well. Rather than multiple genera, there may be two or more names applied to the same genus. For instance, almost everybody has heard of *Tyrannosaurus*. You may not know that its skeleton is identical to *Albertosaurus* and *Tarbosaurus*? The only difference is that the fossil is called *Albertosaurus* when found in Canada, *Tarbosaurus* in China, and *Tyrannosaurus* everywhere else. (Handwerk, 2009)

Visual #13-70

- We have no way to know how much genetic variability each type had. Some similar specimens identified as different genera may merely be variants within one genus.
- Modern reptiles hatch as miniature versions of adults and immediately eat the same diet as adults. Mammals, on the other hand, change significantly as they grow from newborns to adults.

Visual #13-71

Unlike modern reptiles, some of the dinosaurs seem to have acquired new structures as they aged (head frills, different shapes of horns, etc.) that would lead to the adult being identified as a different species than the young.

- Reptiles grow as long as they live, subject to at least two limitations:
  (1) An extremely large animal would have a hard time getting enough food down its throat to maintain its size, let alone grow any more; and
  (2) The heavier it got, the harder it would be for it to walk from one place to another to eat.

Unlike living reptiles, dinosaurs (and the mammal-like reptiles mentioned earlier) seem to have had legs positioned directly underneath the body. This would have enabled them to get around even after they became huge, allowing them to live a long time. Some of the largest specimens may not have belonged to different genera. They may have attained different sizes simply because they lived longer than the rest.

1. UPPER TRIASSIC ANIMALS.

Visual #13-72

The Upper Triassic is the lowest layer known to contain dinosaurs. The "oldest" include *Herrerasaurus*, *Coelophysis*, and *Guaibasaurus*. Some paleontologists have identified as few as sixteen genera from this layer, but others name as many as fifty.

Visual #13-73

Since all we have to work with are bones, there is no way to do breeding experiments to see whether animals truly belonged to different species or genera. Thus, it is impossible to know for sure whether there were really so many different types or whether there were just many variations within the kinds.

Visual #13-74

Besides reptiles, many amphibians and marine animals are found in Triassic rocks. Evolutionists believe they are found together because they lived together. Since dinosaurs are believed to have been land animals, how would they have lived together with water-dwellers? Creationists believe they did not live together but instead were thrown together as they were buried in Noah's flood.

2. LOWER JURASSIC ANIMALS.

Visual #13-75

Several hundred genus names have been assigned to the dinosaurs found in the three Jurassic subdivisions. Since many are based on fragmentary evidence, some of the names may be duplicates. If each of them is really a separate species or genus, there could have been scores of types in each layer. However, this has nothing to do with evolution. Each type (e.g., *Dilophosaurus*, *Lufengosaurus*, *Anomoepus*) appears suddenly and fully formed with no known ancestry. Once they appear they do not evolve. A few are also found in higher strata, but most appear in only this one layer and then disappear without descendants.

Once again, a number of flying (e.g., *Campylognathoides*) and marine reptiles (e.g., *Macroplata*, *Stenopterygius*, are found in the same rocks with the land-based dinosaurs. Creationists believe they were buried together as a result of the Flood.

2. MIDDLE JURASSIC ANIMALS.

Visual #13-76

The same phenomenon is evident in the Middle Jurassic. Many types of land dinosaurs (e.g., *Szechuanosaurus*, *Yangchuanosaurus*, *Bellusaurus*, *Monolophosaurus*, *Spinophorosaurus*) are found buried with marine reptiles such as *Bishanopliosaurus* and *Neptunidraco*. There is no evolution to be seen anywhere.

3. UPPER JURASSIC ANIMALS.

Visual #13-77

Upper Jurassic animals include familiar forms such as *Stegosaurus* as well as others that may not be so familiar: *Camarasaurus*, *Compsognathus* (the smallest known dinosaur, about the size of a chicken), *Othnielia* (not much bigger), the much larger *Camptosaurus*, and the giant *Diplodocus*. This layer also contains the well-known bird *Archaeopteryx* (which we will discuss later), as well as flying reptiles such as *Rhamphorynchus*.

Most of your students are probably familiar with the Jurassic Park movies. They may not be aware that *T. rex*, the star of the show, was actually a Cretaceous dinosaur rather than Jurassic.

4. LOWER CRETACEOUS.

Visual #13-78

Over 500 genus names have been assigned to Cretaceous dinosaurs. The Lower Cretaceous contains such forms as *Sinosauropteryx*, *Deinonychus*, *Jinzhousaurus*, *Scipionyx*, *Hongshanosaurus*, *Microraptor*, *Psitticosaurus*, *Falcarius*, and many birds such as *Confuciusornis*. (Some of the names sound Chinese because many recent fossil discoveries have occurred in that country.)

Visual #13-79

Suppose there really were more than a thousand types of dinosaurs. Does this show anything about evolution? Not at all. Let's use birds for comparison. There are over 2800 named genera of birds in the world today. The large number of types does not indicate that anything is evolving! Likewise, a large number of dinosaur types has nothing to do with evolution.

5. UPPER CRETACEOUS.

Visual #13-80

Upper Cretaceous dinosaurs included the famous *Tyrannosaurus rex* as well as forms such as *Tsintaosaurus*, *Velociraptor* of Jurassic Park fame (smaller than the ones in the movie), *Daspletosaurus*, *Majungatholus*, *Oviraptor*, and *Protoceratops*. The non-di-

nosaurs included marine reptiles such as the ichthyosaur *Elasmosaurus*, flying reptiles such as *Pteranodon*, and birds such as *Ichthyornis*.

As with the creatures in all the rest of the layers, each type appears suddenly and fully formed with nothing leading up to it. Most of the are found only in this layer. They do not evolve into anything.

D. WHERE DID DINOSAURS COME FROM?

Visual #13-81

No transitional forms showing the evolution of any type of dinosaur into any other have been discovered. Each appears suddenly and fully formed, then disappears abruptly at its extinction. Evolutionists have to attribute the missing transitional forms to bad luck; they were just not in the right place at the right time to be fossilized. Creationists believe that the world had fully functional ecological communities by the time God pronounced His work "very good" (Gen. 1:31). Nothing new had to evolve. All the later animals, including reptiles, were descended from those created during the Creation week. The six layers containing dinosaurs represent biomes, not time periods.

Visual #13-82

Visual #13-83

E. WHAT KILLED OFF THE DINOSAURS?

Evolutionists have dozens of hypotheses. One of the most popular, the Alvarez hypothesis, is that an asteroid struck the earth around the Yucatan Peninsula in Mexico about 63 million years ago. The impact is believed to have caused tsunamis and kicked up dust clouds that led to a cooler worldwide climate and brought about their extinction. (There is no word on why other reptiles stayed alive if it was too cold for even the smallest dinosaurs.) Or perhaps they were killed off by volcanic eruptions causing the global cooling. There is even one hypothesis that something must have happened to change the climate and kill the plants that used to serve as natural laxatives for dinosaurs, so they died of constipation!

Visual #13-84

Visual #13-85

Some say that the climate changed and killed them in a few years, while others say it took millions of years. The main evidence for the asteroid hypothesis is that some rocks at the Cretaceous-Tertiary boundary (now known as the K-Pg boundary) have an unusually high concentration of iridium, an element common in meteors and asteroids.

Those who believe the earth was created relatively recently have a different explanation. According to this belief, every air-breathing animal not on Noah's Ark died in the Genesis Flood rather than as a result of a single asteroid impact. The high level of iridium in some Cretaceous rocks need not be the result of asteroid impact. Volcanoes, which would have been included in the "fountains of the great deep" (Gen. 7:11), also spew out this element. This explanation seems much more likely when we consider that Cretaceous rocks are named for their high chalk (calcium carbonate) content. Volcanoes are a major source of this compound, which is not found on asteroids. Any dinosaurs not on board the Ark would have died from the multiple effects of the Flood: meteor impact, volcanic eruption, earthquakes, flooding, and who knows what else. The ultimate cause of death was the Flood.

F. WERE DINOSAURS FEROCIOUS PREDATORS?

Visual #13-86

Movie dinosaurs often come complete with ferocious roaring sounds. However, living reptiles usually make noise only when startled. There is no reason to believe dinosaurs were different.

Were dinosaurs carnivores? Genesis 1 and Exodus 20:11 say that "in six days the LORD made heaven and earth, the sea, and all that in them is." This means that every single thing in the universe, including dinosaurs, was made during the Creation week. Gen. 1:30 says that at the end of the week, all the animals were vegetarians.

Even evolutionists believe that most dinosaurs (all the ornithischians as well as the large sauropods such as *Brachiosaurus* and *Diplodocus*) were vegetarians. Only two dozen or so genera of dinosaurs, all members of **Order Saurischia**, are believed to have been meat-eaters. Of course we can't be sure that any of them really were because we have no eyewitness accounts of what they ate.

Visual #13-87

- Creationists believe that if some dinosaurs ate meat, they began to do so only after Adam sinned. Perhaps their preferred kinds of vegetation became unavailable so they began to eat whatever they could get.
- Those considered meat-eaters had long, sharp teeth - but so do pandas, beavers, and fruit bats, which eat plants unless meat is the only food available.

Visual #13-88

We've never seen a *Tyrannosaurus* eat anything, but we can tell from fossil skulls that their teeth were not very deeply rooted in their jaws. Biting into a large animal that didn't want to be eaten might have cost them quite a few teeth. If they ate meat at all, they probably ate small animals or decaying carcasses.

Visual #13-89

They may not have been very fast either. If you saw the movie "Jurassic Park," you no doubt remember the scene where the *Tyrannosaurus* tried to catch a Jeep and eat the passengers. It was exciting but not realistic. A large dinosaur's velocity would have been limited by the ability of its leg bones to withstand the impact of its enormous weight as it ran. The faster it went, the greater the impact. A 1991 study of dinosaur leg bones analyzed their ability to withstand such impact, based on diameter, density, and porosity. It turns out that they would have broken if a large animal such as a *Tyrannosaurus* tried to run more than about 15 miles per hour (Alexander, 1991). It is unlikely that a large dinosaur could have run fast enough to catch many smaller animals, let alone a Jeep.

G. WERE DINOSAURS WARM-BLOODED?

Because a number of dinosaur fossils have been found near nests of eggs, some scientists believe that they exhibited maternal behavior and may have been warm-blooded. Perhaps some of the smaller ones were, but the larger types (*Brachiosaurus*, *Diplodocus*, etc.) could not have been. A warm-blooded animal must consume many times the amount of food that a cold-blooded animal of the same size needs to stay alive. A warm-blooded animal the size of the large dinosaurs, eating twenty-four hours a day, would have a hard time getting enough food down its throat to survive (Ostrom, 1978, 171). The larger dinosaurs, at least, must have been cold-blooded like every reptile man has ever seen.

If the smaller ones were warm-blooded, they were different from any reptiles within human experience. In this case, evolutionists are faced with a problem: natural selection is believed to assist evolution by giving a survival advantage to plants and animals that have acquired beneficial new features. Yet warm-blooded creatures are at a disadvantage. They need to eat more food because of their faster metabolism.

The problem is magnified when we consider the fact that birds and mammals, both of which are warm-blooded, are supposed to have evolved from separate orders of reptiles. Natural selection would work against evolution in both cases.

Even if some dinosaurs were warm-blooded, so what? The great white shark is the only known warm-blooded fish but it is not considered more highly evolved than any other fish. Warm-bloodedness by itself doesn't prove anything about evolution.

H. HAVE HUMANS EVER SEEN LIVING DINOSAURS?

Visual #13-90

Evolutionists say that if man lived at the same time as dinosaurs, their fossils should be found together. However, if creationists are right and the strata represent ecological communities rather than time periods, it stands to reason that humans would not be likely to be found with dinosaurs. Even very stupid ancestors would realize that it was dangerous to live among animals that might eat them or step on them. They would not stay around long. Thus, it would be very unlikely to find human fossils with dinosaurs.

After the Flood, the earth's climate was much different. If the dinosaurs were cold-blooded like every known type of reptile, those that were unable to find warm areas would die out quickly. However, a few may have found suitable environments and stayed alive until fairly recent times. The word "dinosaur" would not have been used to describe them

because it was not invented until the mid 1800's. Thus, it is not likely that we would find it in the Bible. Nevertheless, there are a number of Biblical passages that describe animals that may have been dinosaurs.

1. POSSIBLE BIBLICAL REFERENCES.

a. Giants.

Visual #13-91

Genesis 6:4 tells us that just before the Flood, there were "giants" in the earth. Most people understand this to refer to giant humans. However, the Hebrew word "nephilim" does not necessarily have to refer to humans. It could be a reference to giant animals such as reptiles roaming the earth before the Flood.

b. Behemoth.

Visual #13-92

Christians and Jews have always accepted the Book of Job as the first book of the Bible actually written down, not too many centuries after the Flood.

Visual #13-93

In Job 40:15 - 24, God instructs Job to behold "Behemoth," a huge animal with a tail like a cedar tree. No living animal has such a tail. You can't behold something that isn't there, so Behemoth must have still been alive when the Book of Job was written a few centuries after the Flood.

c. Leviathan.

Visual #13-94

In the next chapter of Job, verses 41:1-10 and 15-21 describe an animal called "Leviathan." It was a fearsome animal described as having tightly knit scales, so many assume it was some sort of crocodile. However, the passage also says that it breathed fire.

Visual #13-95

There are legends of fire-breathing dragons from so many places around the world that there must be some basis in fact. Perhaps some reptile with a crested head like *Parasaurolophus* or some unknown type had an internal mechanism similar to that of the "Bombardier beetle" that enabled it to breathe out gases hot enough to kindle fire?

d. "Unicorns."

Visual #13-96

Several time the older translations like the King James Version mention "unicorns." The translators used the reference materials available to them, which included the Greek Septuagint text of the Old Testament. Whenever the Hebrew text used the word "re'em," the Septuagint translators rendered it in Greek as "monocera," which simply means a one-horned animal. (Some more recent translations say "rhinoceros" or "wild ox" instead.) However,the translators of previous centuries were not aware that there were a number of one-horned dinosaurs such as *Monoclonius*. Could this be the one-horned animal God referred to?

2. MODERN STORIES OF LARGE REPTILES

a. Congo.

Visual #13-97

Natives of the Congo have reported sightings of a large animal they call "Mokele mbembe" as recently as 1995. This creature is reported to live in the deep jungle. When shown pictures of various large animals, eyewitnesses say that Mokele mbembe looks like one of the large dinosaurs such as *Diplodocus*. (S*cience Digest*, June, 1981; Chadwick, 1995)

Scientists have not followed up on these reports for several reasons.

i. Most ignore such reports because they believe all the dinosaurs are extinct.

ii. The natives refuse to show scientists where the creatures are because they believe they will kill them.

iii. We can't see them from the air because they are in the deep jungle under a thick tree cover.

iv. We can't spot them with infrared satellite scans because cold-blooded animals match the temperature of their surroundings.

b. Zimbabwe.

Modern residents of northern Zimbabwe report seeing flying reptiles which resemble the *Pterodactyl*. (P. Taylor, 1987, 45)

c. DO NOT USE THIS ARGUMENT: Tissue analysis has falsified a report that a Japanese fishing vessel in 1977 hauled in the partially decayed carcass of a plesiosaur off the coast of New Zealand. The catch was instead a decayed "basking shark."

3. PHYSICAL ARTIFACTS.

a. Mosaic Floor in Zippori, Israel.

The city of Zippori (also known as Sepphoris) in the north of Israel contains at lest one fascinating image preserved in mosaic tile.

When Jerusalem rebelled against Rome in the first century, it was damaged but not destroyed. However, when it rebelled again in the Bar Kokhba rebellion of the second century, it was totally wiped out. A few miles to the north, the residents of Zippori saw what had happened and sent word to Rome asking that their city be spared and pledging loyalty to the Roman Empire. Their city was left intact and is now an archaeological site.

Visual #13-98

One of the undisturbed artifacts in Zippori is a very high quality mosaic floor in a house dating to the 300s. Images on the floor include humans such as the "Mona Lisa of Zippori," flowers, ostriches, and what appears to be a small dinosaur. Two men are attacking it, one with a spear and the other with a large stone. The animal

Visual #13-99

has a fat body, tail held off the ground, and stripes. (It is strongly reminiscent of a *Zuniceratops*, except that it does not have a head frill.)

Dinosaurs were unknown to scientists until the mid-1800s. It was only recently that they concluded that many of the dinosaurs had fat bodies, tails held off the ground, and stripes. How would the mosaic artists of the fourth century have know what a dinosaur looked like, unless they saw it themselves?

Visual #13-100

The same mosaic floor also contains an image of a small crocodilian-type animal with an odd cloud billowing out of its mouth. Could it be a small fire - breathing dragon?

b. Dinosaur Footprints.

The riverbanks of the Paluxy River in Glenrose Texas are largely composed of limestone, which is natural cement. The banks contain many three-toed dinosaur footprints. Since tracks cannot form in hardened cement and since limestone (calcium carbonate) is known to come out of volcanoes, we can infer that there was a flow of calcium carbonate that had not had sufficient time to harden before the dinosaurs walked in it.

Visual #13-101

The most noteworthy feature of these tracks is that there is at least one five-toed human footprint actually inside one of the dinosaur footprints. In order for the human print to be preserved, the limestone had to still be soft. This would imply that at least one human was there within a few hours of a dinosaur.

Evolutionists refuse to accept this possibility, so they say there must have been some sort of unknown dinosaur with a five-toed foot that looked human.

c. Ica Carvings.

Visual #13-102

Many carvings of animals that look like dinosaurs have been dug up in Ica Province, Peru. They have been buried for hundreds of years, long before dinosaurs were discovered. Though the Ica Stones are in undisturbed deposits, evolutionists have to say they are frauds. Otherwise, the stones would imply that humans actually saw dinosaurs. Since dinosaurs are supposed to have become extinct at least 60 million years before humans evolved, the evolutionists must discard the evidence because it does not fit their preconceived ideas.

d. Ta Prohm Temple of Cambodia.

Visual #13-103

The Ta Prohm temple in Cambodia, dating to the 1100's, contains many decorative stone carvings on its pillars. One of them is a carving of something that looks like one of the stegosaurid dinosaurs. It depicts a fat-bodied animal with several vertical plates along the length of a hunched back. It is a bit different from known forms such as *Stegosaurus* in that it has two horns rather than just a small head, but it has a definite dinosaurian appearance. Somebody in the 1100's must have seen *something* to know what to carve.

Other nearby carvings show realistic animals such as deer, boars, and monkeys. To this author's amusement, a skeptic said that one of them looked like a lion-like creature wielding a sword. It was actually a depiction of a Hamadryas baboon, common in the area, waving a stick.

4. LEGENDS AND HISTORICAL REFERENCES TO DRAGONS

a. Babylon.

The "Gilgamesh Epic" of ancient Babylon reports that Gilgamesh killed a large reptile that ate trees and reeds. He kept its head for a trophy. (P. Taylor, 1987)

b. Scandinavia.

A Scandinavian legend describes a reptile-like animal with a body the size of a large cow, with long rear legs and short front ones. (P. Taylor, 1987)

c. France.

The French city of Nerluc was renamed to commemorate the killing of a "dragon" there. It was bigger than an ox and had long, sharp horns on its head. (P. Taylor, 1987)

d. Switzerland.

A well-known European science book, the *Historia Animalium*, reported that "dragons" were still living in the 1500's, though rare. (P. Taylor, 1987)

e. Italy.

Italian scientist Ulysses Aldrovanus in 1572 measured and drew a picture of the carcass of a small "dragon" killed by a farmer in northern Italy. It had a long neck and tail and a fat body. (P. Taylor, 1987)

f. China.

China has thousands of dragon stories and pictures.

g. Ireland.

An Irish writer (ca. 900 A.D.) reported encountering a large reptile with a head shaped somewhat like a horse's, iron-like spikes on its tail, thick legs, and strong claws. (P. Taylor, 1987)

h. Egypt and Arabia.

The Greek explorer Herodotus (ca. 460 B.C.) reported seeing flying reptiles similar to *Rhamphorhynchus* in Egypt and Arabia. The well-known philosopher Aristotle said that in his time it was common knowledge that such creatures still lived in Ethiopia. (P. Taylor, 1987)

I. HOW COULD ANY DINOSAURS HAVE SURVIVED THE FLOOD?

Visual #13-104

The only air-breathing land animals that made it through the Flood had to be on Noah's Ark. But how could Noah get all those huge dinosaurs on a single boat?

1. GOD BROUGHT THE ANIMALS.

Noah did not select the animals that came onto the Ark. God brought them to him.

2. CONTINUED GROWTH OF REPTILES.

A reptile grows as long as it lives. Even the largest dinosaurs hatched from eggs not much bigger than a football. They were probably smaller than elephants when they reached reproductive age.

Even a human with low intelligence could figure out that it would not be a good idea to bring full-grown sauropods on a boat. God is much smarter than we are. It would have made sense to bring young specimens on the Ark instead of old ones. They could have fit more easily and they would have had much more time to breed after the Flood.

3. MOST DINOSAURS WERE NOT HUGE.

Only a few genera, perhaps a few dozen, grew to enormous sizes. Most of the rest were fairly small.

4. SIZE OF THE ARK.

Visual #13-105

The Ark was much larger than most people imagine. In fact, it was the biggest boat ever built until the 1860's. Based on the dimensions described in the Bible, it had a cargo capacity of almost 1.4 million cubic feet, roughly equivalent to 522 railroad stock cars. It would have easily accommodated over 125,000 sheep-size animals (Bliss, 1976).

Most animals are much smaller than sheep. Since Noah only had to take on a pair of each "kind" rather than each breed or species he would only have needed room for at most a few tens of thousands of sheep-size animals. (The "Ark Encounter" in Kentucky estimates that the number was low as a few thousand.) Even if Noah had to take several hundred pairs of elephant-sized dinosaurs he still would have had room to spare.

Evolutionists, gap theorists, and progressive creationists might object that since dinosaurs are not mentioned in the Bible, they must have died out before Genesis 1:2. This a very weak argument.

- First, The Bible doesn't mention kangaroos, orangutans, skunks, and many other well-known animals. Does this mean they died before Adam?
- Second, as we have already seen, the Bible refers to several creatures that may have belonged to some sort of dinosaurian group: "behemoth," "leviathan," dragons, and "unicorns."

XIV. DID BIRDS EVOLVE FROM DINOSAURS?

Visual #13-106

Anybody who goes to dinosaur movies or reads biology textbooks will be inundated with the idea that dinosaurs are not really extinct, but they just evolved feathers and turned into birds. So what is the evidence?

A. ARGUMENTS FOR DINOSAUR TO BIRD EVOLUTION.

1. SIMILARITY OF PELVIS.

Visual #13-107

Birds have a bird-type pelvis. One of the two orders of dinosaurs, Ornithischia, also had a bird-type pelvis.

2. OVERALL SHAPE

Some of the dinosaurs, the "bird-mimics" such as Gallimimus, Ornithomimus and Struthiomimus, had an overall shape reminiscent of large birds such as ostriches.

3. REPTILIAN FEATURES IN ARCHAEOPTERYX.

A fossil bird found in Jurassic rocks, *Archaeopteryx*, had some characteristics often found in reptiles, such as teeth and claws.

4. FEATHERS.

There have been recent claims that some dinosaur fossils showed indications of feathers.

5. LACK OF OTHER CANDIDATES.

Birds had to come from *somewhere*. The only other type of animals built somewhat like them are dinosaurs.

B. ARGUMENTS AGAINST DINOSAUR TO BIRD EVOLUTION.

1. TWO MAJOR TYPES OF PELVIS.

Ornithischians, those with a bird-type pelvis, are the wrong order of dinosaurs. Birds are supposed to have evolved from one of the theropods of **Order Saurischia** (lizard-type pelvis) such as dromaeosaurs.

Though evolutionists pay almost no attention to the difference in pelvic structure,

Visual #13-108

it is a major problem. Some ancient "stem reptile" with a lizard-type pelvis had to have information in its DNA that was able to experience mutations so that some of its descendants evolved bird-type pelvises, while others kept the lizard-type for millions of years.

Much later, some of the theropods had to undergo the same type of mutations as the ornithischians so that their lizard-type pelvises independently developed into bird-type pelvises and helped turn them into birds. Meanwhile, they had to be able to walk despite the major structural changes. They did not leave a single shred of fossil evidence of the transition from lizard-type to bird-type.

2. "BIRD-MIMICS."

Several types of "bird-mimics" have an overall structure reminiscent of birds. These included *Avimimus*, *Ornithomimus*, and *Struthiomimus*. The latter had a shape somewhat like that of an ostrich. However, the internal structures of all the bird-mimics are drastically different from any known bird.

a. Lungs.

Visual #13-109

In mammal and reptile lungs, air flows into sacs, exchanges gases with the bloodstream, then flows back out. Birds have sacs, but they are not used for gas exchange. Instead, they are used to change pressure inside the lungs, causing air to be drawn in and pushed out. The gas exchange takes place in "air capillaries," tubules that extend deep into other parts of the body (even the brain). Birds use two respiratory cycles to move the air through the entire respiratory system, whereas other creatures use only one. Birds are able to transfer oxygen more efficiently, but this also makes them more susceptible to harmful gases. (That's why canaries were used as indicators of harmful gases in mines. They die long before humans.)
(From www.petcoach.co/article/respiratory-system-of-birds-anatomy-and-function/)

b. Body temperature.

Reptiles match the temperature of their environment (cold-blooded), whereas birds are warm-blooded.

c. Brain structure.

Birds have a highly developed cerebellum and cerebral hemisphere to control their fine motor movements. This allows them to perform the complex body movements needed for flight. (Wilson, 2014)

d. Wing vs. arm movement.

Flapping requires the wings to move backwards from the body. This is the opposite type of motion from walking and grasping, which require the limbs to move forward.

e. Feathers.

Visual #13-110

Feathers are unknown in any class other than birds, but are found in every bird. How would such a structure have evolved? There would have to be a series of more and more birdlike reptiles. Mutations in DNA would cause the scales to gradually fray, ultimately developing into the intricate pattern of hooked fasteners (similar to Velcro®) we find in feathers.

The evolving ancestors would have started with impermeable solid scales, gone through a stage of permeable frayed scales, then back to impermeable feathers (Denton, 1985). *Archaeopteryx* does not show such a development; its feathers "differ in no way from the most perfectly developed feathers known to us" (Gregory, 1916).

It is difficult to imagine a scenario in which any type of feather could gradually evolve from scales, but the problem is far more complicated. There are at least 12 distinct types of feathers known, such as:

- Down feathers used for insulation.

- "Powder-down" feathers which not only insulate but also release a talc-like powder that helps in waterproofing.
- Filoplume feathers used for decoration and sensory input.
- Bristle feathers such as those found on flycatchers.
- Remiges, strong feathers used in fast powered flight by hawks, pigeons, and the like.
- A different variety of remiges, soft ones such as those used by owls for slow, silent flight.

(Bergman, 2003) Most birds use multiple types of feathers. Yet despite the fact that they are supposed to have evolved from scales, none of the feather types shows any structural similarity to scales.

Feathers enable birds to vary the geometry and aerodynamic properties of their wings for different purposes: takeoff, landing, flapping, gliding, and soaring. Many birds have an intricate system of tendons which allow the feathers to twist and open like the vanes of a blind on the upstroke but close completely on the downstroke. This greatly improves the efficiency of flight.

Feathers also solve the problem of turbulence, which reduces lift and causes stalling. Only recently have engineers discovered how to simulate some of their features to increase stability in airplanes. As Denton says, "One need only watch the darting-backwards-and-forwards flight of the humming bird to grasp something of the excellent aerodynamic properties of the feathered aerofoil" (Denton, 1985).

3. WHY WOULD ANYTHING EVOLVE?

Visual #13-111

Every living thing gets its physical characteristics (its phenotype) from the information contained in its DNA (its genotype). Mutations are random copying mistakes during DNA reproduction. In order for anything to evolve, there would have to be a series of thousands or millions of beneficial mutations in DNA, despite the multiple error-correcting mechanisms in cell reproduction. The mutations would have to build up generation after generation, becoming the source of new structures (bones, eyes, wings, feathers, etc.). Meanwhile, not a single transitional specimen was preserved as a fossil.

4. FOSSIL BIRDS.

One of the fossils most often presented as an example of a transition between major types is a bird known as *Archaeopteryx*.

a. Reptilian characteristics of Archaeopteryx.

Visual #13-112

It had certain characteristics found most often in reptiles: a long bony tail, claws on its wings, a relatively shallow breastbone, and teeth. But so do other undisputed birds.

- Living swans have long bony tails.
- Living ostriches, hoatzins, and touracos have claws.
- Hoatzins have a relatively shallow breastbone.
- Two undisputed fossil birds, *Hesperornis* and *Ichthyornis*, also had teeth.

b. Avian characteristics.

It had other characteristics usually associated with birds: hollow bones and feathers.

c. Wrong timing.

At least four types of fossil birds, *Aurornis*, *Anchiornis*, *Xiaontingia*, and *Archaeopteryx* are known from the upper Jurassic (Abrahams & Bordy, 2023). The latter, commonly presented as the ancestral bird, is dated around 150 million years ago. It should have evolved from much earlier dinosaurs that had evolved an ornithischian pelvis. The rest of the birds are then supposed to have evolved from it.

Remember that the "first" dinosaurs appeared in the Upper Triassic. These included a few of the lizard-hipped theropods, from which birds are supposed to have evolved. A major problem, though, is that *Archaeopteryx* is not the oldest known

bird! This distinction belongs to Protoavis.

Since *Archaeopteryx* is dated from the Upper Jurassic, any birds descended from it should appear in more recent strata. However, in 1977 archaeologist James Jensen of Brigham Young University claimed to have discovered a bird femur and two connected shoulder bones which he called Proavis in Jurassic deposits in the Morrison Formation of western Colorado. These rocks are dated sixty million years older than any previously known to contain true birds. If his interpretation of the bones is correct, *Proavis* was contemporary with *Archaeopteryx* (Science News 112:198).

Visual #13-113

Jensen's claim was based on very little evidence and has not been widely accepted. A far more damaging discovery occurred in 1986 when paleontologist Sankar Chatterjee of Texas Tech discovered the remains of two crow-sized birds which he dubbed *Protoavis* in late Triassic deposits in the Dockum Formation in Texas (Chatterjee, 1999). These rocks are dated about 225 MYA, seventy-five million years older than those in which *Archaeopteryx* was found. This means that *Archaeopteryx* is 75 million years too late to be the ancestor of the other birds. Not only that, *Protoavis* appeared in the same strata as the first theropods and tens of millions before the earliest known birdlike dinosaurs. How could it be their descendant? Evolution's best transition, reptiles to birds, must be discarded.

The recent discovery of birdlike tracks attributed to *Trisauropodiscus* in southern Africa (Abrahams & Bordy, 2023) has added more uncertainty. Though no body fossils are known, these tracks are dated between the late Triassic and early Jurassic, ca. 215 MYA. If the tracks were made by birds, they would have had to evolve more than 60 million years before *Archaeopteryx*. It could not have been their ancestor.

d. Insufficiency as an ancestor.

Visual #13-114

Even if you accept any of these as the ancestor of modern birds, which birds? There are around 2800 known genera in the world today, as well as many fossil birds. Any transition from reptile to bird would have to have had the potential in its DNA to give rise to ostriches, cassowaries, eagles, owls, hummingbirds, penguins, finches, parrots, vultures, pigeons, chickens, ducks, pelicans, woodpeckers, and all the thousands of other living forms, as well as the extinct ones like the huge "terror birds" of the family Phorusrhacidae. All this evolution of thousand of types would have to take place in spite of the error correcting mechanisms built into DNA.

Yes, birds had to come from *somewhere*. You may choose to believe they evolved as a matter of faith, but there is no evidence to back it up.

C. "FEATHERED DINOSAURS"

In recent years there have been reports that some dinosaur fossils appear to have had feathers. (Details are almost never given about which of the 12 or more types of feathers they are supposed to have been.) Even if these reports are verified, they have nothing to do with dinosaur to bird evolution.

Visual #13-115

We usually think that only birds have feathers. If other animals did, so what? We usually think that only reptiles and birds lay eggs, but so do two types of mammals (the platypus and the echidna) We usually do not think of mammals as poisonous, but the platypus has poison glands. We do not think of fish as warm-blooded, but the great white shark is. Likewise, if some dinosaurs had feathers it would only show that we don't know as much as we think we do.

Visual #13-116

Whether dinosaurs are extinct or not, none have any known ancestors or descendants. They appeared abruptly and fully formed in the fossil record, belonged to six distinct biomes with little overlap, and seem to disappear equally abruptly. Anyone who claims to know of a single fossil illustrating the origin of any dinosaur kind or the evolution of one kind into another should notify the rest of the world. Evolutionists are desperate for one.

In this chapter we have seen three obvious characteristics in the fossils of "lower" life forms, all the way up through reptiles:
(1) An explosive appearance of the higher taxa at the Cambrian Explosion;
(2) Sudden appearance of every kind in the fossil record;
(3) Stasis, or resistance to basic change.
All three of these are exactly what creation led us to predict. They are the opposite of what evolutionists expected. In the next two chapters we will see that the same holds true for mammals in general, and humans in particular.

CHAPTER 13 REVIEW

Evolution and creation lead us to make at least 5 contradictory predictions about the fossil record. We saw in Chapter 11 that the first two are (I) Uniformitarianism vs. Catastrophism and (II) Poorly Defined Communities vs. Clearly Defined Ecological Communities. In both these areas creation is clearly correct and evolution is wrong.

The next three predictions are (III) Few vs. Many higher taxa from the beginning; (IV) Gradual vs. Sudden appearance of new types; and (V) Unlimited directional change vs. Stasis. Even using the evolutionary time scale we see that creation is correct and evolution is wrong.

I. The Cambrian Explosion, supposedly about 600 million years ago, included a sudden explosive appearance of fully formed representatives of all 23 phyla of the animal kingdom as well as many types of plants. No ancestors are known.

   The Ediacaran Fauna show that pre-Cambrian rocks were suitable to preserve fossils. Ancestors of the Ediacaran animals are also unknown.

II. There is no such thing as a simple cell. Every one-celled organism known is highly complex. There are two basic types, prokaryotes and eukaryotes. Each is far more complex than evolutionists' hypothetical first cell. No one-celled organism has any known evolutionary ancestors.

III. There are no known transitional forms between one-celled (Protozoa) and multi-celled (Metazoa) organisms.

IV. Complex invertebrates and vertebrates appear in the fossil record suddenly and fully formed with no known ancestry.

V. No one has been able to trace the evolution of a single type of plant from one-celled to the present. Every major group appears in the fossil record suddenly and fully formed.

   There is no such thing as a simple plant. The "earliest" plants in the fossil record are identical to modern stromatolites (blue-green algae). These use photosynthesis to manufacture their cell structures. The photosynthetic mechanism is too small to observe with any but the most powerful electron microscopes, yet it is far more efficient in the use of sunlight than anything man has ever devised.

VI. Arthropods (insects, spiders, crustaceans, and trilobites) appear in the fossil record suddenly and fully formed with no known ancestry. Tens of thousands of species are known, but not one transitional sequence shows how any of them might have evolved.

   Trilobites were among the "earliest" animals. They were not at all primitive. Their eyes were extremely complex from the beginning.

VII. The first vertebrates appear suddenly and fully formed in upper Cambrian rocks with no

known ancestors. Evolutionists believe it took about a hundred million years for them to evolve from something like a segmented worm, but there is not a single fossil showing such a process.

VIII. All six Paleozoic orders of amphibians are supposed to be evolved from fish, but only one order (**Ichthyostegalia**) had an overall body shape similar to fish. The other five were very un-fishlike.

No transitional forms are known between fish and ichthyostegids. They are believed to be the evolutionary transition to land only because there are no other candidates.

IX. The two genera proposed as possible transitions between amphibians and reptiles appear twenty million years too late in the fossil record to be reptilian ancestors.

Amphibians have a simple gelatinous egg; reptiles have a complex amniotic egg. No living or fossil animal known has an in-between egg type.

X. There are many misconceptions about extinct reptiles.

A. Marine reptiles such as plesiosaurs and ichthyosaurs were not dinosaurs. Evolutionists believe they evolved in a series of steps as fish evolved into amphibians, reptiles evolved farther, then marine reptiles went back in the water, giving up all their new features and getting back the old fishlike structures. No fossil transitions are known for any of these stages.

B. Members of **Order Pterosauria** (flying reptiles) were not dinosaurs either. They were one of five orders belonging to **Subclass Archosauria**. This subclass also included **Order Crocodilia** and the two dinosaur orders, **Saurischia** and **Ornithischia**. No fossils show an evolutionary ancestry for any of the archosaurs, including dinosaurs. Likewise, no fossils connect any two groups of dinosaurs.

There may have been hundreds of genera of dinosaurs. Some were ornithischian (bird-hipped) and the rest were saurischian (lizard-hipped). Only a few dozen genera were extremely large. Most were much smaller, with some as small as a chicken.

C. Common questions about dinosaurs:

1. Though most people picture dinosaurs as ferocious carnivores, paleontologists believe that only about two dozen genera ate meat. They base this belief mainly on tooth structure. Since we have never seen dinosaurs eat anything, we cannot be sure this is correct. Some living animals have sharp teeth and eat plants unless meat is the only food available. Likewise, some dinosaurs may have started as plant eaters and later learned to eat meat. Even if they did, they may have been scavengers rather than fierce hunters.
2. We cannot tell for sure if dinosaurs were warm-blooded. It is unlikely that the larger ones could have been because it would have been difficult for them to eat enough to maintain a warm-blooded metabolism. If some smaller dinosaurs had warm blood, it doesn't prove anything about evolution. The great white shark is warm-blooded but is not considered more highly evolved than any other fish.
4. The Ark had a cargo capacity of about 1.4 million cubic feet. Most dinosaurs were fairly small and could easily have fit. Since the young of even the largest kinds were no larger than elephants, it would have been no problem to fit them also. They encountered a much different climate after they left the Ark. As cold-blooded animals, most probably died off within a few centuries after the Flood. A few may have survived longer in warm climates.
5. Though human and dinosaur fossils are seldom found together, footprints that seem to be human overlap those of dinosaurs at the Paluxy River in Texas.
6. As late as 1996 natives of the Congo described seeing a large animal they called Mokele mbembe in the deep jungle. When shown pictures of various kinds of animals, they identified it as a large dinosaur.

CHAPTER REVIEW QUESTIONS

1. Which fossils area alleged to show the transition form non-life to life? _____
2. Are the fossils found in the Ediacaran Fauna considered primitive ancestors of later fossils? _____
3. All known plants require photosynthesis. Besides needing the elements Carbon, Hydrogen, Nitrogen. Oxygen, Phosphorus, and Sulfur (CHNOPS), they would also need what element to perform this process? _____
4. Life is supposed to have begun near sea level. However, the supposedly oldest organisms are found in Precambrian sediments far below sea level. What explanation does evolution offer for why they first dove to the bottom of the sea and then how they started evolving back up to sea level? _____
5. How many two celled, three celled or other types with only a few cells are known? _____
6. In colonial protozoans, the organisms live in _____ but each cell has to perform all its own necessary functions of life.
7. What connections are known between the Ediacaran Fauna and either earlier or later forms of life? _____
8, Are the fossils found in the Cambrian Explosion considered primitive ancestors of later fossils? _____
9. How many types of plants have been traced from the beginning of life to the present? _____
10. The "early" fossils known as trilobites have (simple / complex) eyes.
11. What types of fossils are known to connect any or all of the Classes of fish? _____
12. Do coelacanths ever use their fins for walking or their "lungs" for breathing? _____
13. Which types of fish proposed as amphibians ancestors have either a pelvic (hip) or thoracic girdle to which legs are attache3d? _____
14. Of the nine orders of amphibians, how many have any proposed connections to fish? _____
15. How many of the nine orders do not have even a hypothetical connection to fish? _____
16. The _____ of amphibians, with only a few divisions, are relatively simple compared to those of reptiles, which contain over a dozen.
17. The _____ of alleged reptile ancestors are out of sequence with those of amphibians.
18. Though "mammal-like" reptiles are supposed to be more advanced than dinosaurs, they occur in lower layers. According to the evolutionary time scale, this would mean that the more advanced types are actually (older / younger) than the "more primitive" dinosaurs.
19. There are six geologic layers that contain dinosaurs. How many types of dinosaurs have been demonstrated to evolve from one layer to another? _____
20. Give an example of an artifact that shows that humans may have seen living dinosaurs. _____ _____
21. Rather than a bird-type pelvis, every dinosaur proposed as an ancestor of birds has a pelvis similar to a _____.
22. The _____ found in birds are different from any other type of animal.
23. There are at least _____ different types of feathers found in birds.

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