

## CHAPTER 5 - DEVELOPMENT OF LIFE AFTER ITS ORIGIN: The Fossil Record.

In the last chapter we considered some of the available biological information to see what could happen in nature. In this chapter we will examine some of the fossil evidence to help us determine what DID happen.

Visual  
# 5-1

Though some try to set a minimum age of 10,000 years in order for something to be considered a fossil, this is completely arbitrary. Fossils are simply the preserved remains of formerly living plants and animals. They may consist of an entire organism, parts of it (leaves, bones, etc.), or traces of its presence such as footprints, worm burrows, and the like.

Fossils do not come with written instructions telling us what they mean. We can make predictions about what sort of fossils we should find in nature based on initial complexity vs. initial disorganization, but we cannot do experiments to prove what happened in the prehistoric past. All we can do is need to depend on logic to determine which is more likely to be correct.

### I. CONTRASTING BELIEFS ABOUT THE DEVELOPMENT OF LIFE SINCE ITS ORIGIN. A. INITIAL COMPLEXITY.

Visual  
# 5-2

The concept of creation (Initial Complexity) says that life came into existence in a complex condition as a result of processes that are not going on in the world today. The first members of each major type already had their ordinal characters – the things that identify a cat as a cat, a dog as a dog, and so on. However, they might not have been recognizable as any modern variety. For instance, the first dogs would probably have looked like some sort of wild dogs but probably not Chihuahuas.

Visual  
# 5-3

Living things are classified according to taxonomic categories. Initial Complexity includes the idea that all the higher *taxa* (singular *taxon*) such as kingdoms, phyla, classes, orders, and families were present from the very beginning. (We do not know which level would correspond to the “kinds” mentioned in Genesis.) If enough specimens were fossilized, the higher *taxa* would have been represented by at least a few of them.

- Since life began in its most complex condition, the number of higher *taxa* would not have increased through time but could actually have decreased due to extinction.
- The lower *taxa* of genus and species are defined by their ability to interbreed. Since it is impossible to do breeding experiments on fossils, the number of lower *taxa* is difficult to determine and may vary depending on who is doing the classifying. .

The DNA of the first specimens already had millions or billions of base pairs, enough genetic information for descendants to later diversify into multiple genera and species. Since the designation of species (and possibly genus) is arbitrary, the number of lower categories could possibly increase.

### B. INITIAL DISORGANIZATION.

The concept of evolution (Initial Disorganization) says that life came into existence in a disorganized condition as a result of unknown processes that were part of nature.

The first living cell was extremely primitive and would not have been recognizable as any type living in the world today. It did not have an information storage system of any type that we would recognize. Whatever this system was, it eventually evolved into something like RNA and still later into DNA.

The first cell would have been classified as belonging to only one kingdom, phylum, class, order, family, genus, and species. Its descendants experienced a great number of mutations during reproduction. After a while, a second species would have developed, then a third, and so on. Eventually more genera would have evolved, then more families,

more orders, more classes, more phyla, and more kingdoms. Thus, we should find that the number of higher taxa increases through time, while the number of lower categories might vary due to extinction or evolution. Neo-Darwinists believe this process happened gradually, while Punctuacionists believe it happened in sudden jumps.

### C. ACTUAL OBSERVATION NOT POSSIBLE.

Since we cannot directly observe the past, the best we can do is to apply logic to the fossil evidence to see whether initial complexity or initial disorganization is more reasonable.

Visual  
# 5-4

Though this book is written from a young-earth perspective, standard geologic terminology will be used throughout. It will become apparent that even if the geologic time scale is correct, evolution is nowhere to be seen in the fossil record.

## II. THE GEOLOGIC COLUMN.

Visual  
# 5-5

The geologic column as seen in textbooks does not exist in nature. It was pieced together from many locations around the world. Even though the order is fairly consistent when two or more strata are found together, every stratum can be found out of order somewhere.

Visual  
# 5-6

The single most complete section of the geologic column in the world is at the Grand Canyon in Arizona, where six Paleozoic strata are found. Cambrian overlies Precambrian, then Ordovician and Silurian are missing (a gap dated at 70 million years), then Devonian, Mississippian, Pennsylvanian, and Permian.

### A. NOMENCLATURE.

The geologic column is divided into Eras, Periods, and Epochs, based on the assumption that the strata represent time periods.

#### 1. ARCHAEOZOIC ERA (*Pre-Cambrian*).

At the lowest level is the Archaeozoic (Pre-Cambrian) Era. It contains very few fossils.

#### 2. PALEOZOIC ERA.

The next higher major division is the Paleozoic (once called the PRIMARY) Era. It is subdivided into six or seven Periods.

- From bottom to top, the Cambrian, Ordovician, Silurian, and Devonian Periods contain suites of animals and plants that we would expect to find at the bottom of the ocean and then shallower and shallower depths.
- The Mississippian and Pennsylvanian Periods (often grouped together as the Carboniferous) contain the kinds of flora and fauna we would expect to find around sea level, especially in marshy environments. The next higher level, the Permian Period, is known for vast numbers of amphibians. (One Permian deposit, known as the Karoo Supergroup of South Africa, is estimated to contain at least tens of billions of amphibian and “mammal-like reptile” fossils.)

#### 3. MESOZOIC ERA.

Above the Paleozoic is the Mesozoic (once called the SECONDARY) Era. The Mesozoic is known as the “Age of Reptiles” because it is noted for the presence of a great many animals of that class.

- The Mesozoic is divided into three Periods, which in turn are divided into eight sub Periods: Lower, Middle, and Upper Triassic, Lower, Middle, and Upper Jurassic, and Lower and Upper Cretaceous. Most of the animals in these layers are of the types we would expect to find in warm climates.

#### 4. CENOZOIC ERA.

Above the Mesozoic is the Cenozoic Era, known as the “Age of Mammals.”

- Lower Cenozoic strata are known as the TERTIARY Period, which is in turn divided into the Paleogene and Neogene sub periods.
- The Paleogene sub period is divided into the Paleocene, Eocene, and Oligocene Epochs.
- The Neogene sub period is divided into the Miocene and Pliocene Epochs.
- Upper Cenozoic strata are known as the QUATERNARY Period. This is in turn divided into the Pleistocene and Holocene (Recent) Epochs.

## B. SOURCE OF NAMES.

Only a few of the names of the divisions have anything to do with time. Most names are derived from the places where the characteristic group or *suite* of fossils in the rocks was first identified.

- The first fossils designated Cambrian were found in Wales, which in Latin is “Cambria.”
- Ordovician fossils were first identified in the area of England where the ancient Ordovices used to live.
- Silurian fossils were first found in the area once occupied by the ancient Silures on the border of England and Wales.
- Devonian fossils were first found near Devonshire, England.
- Mississippian and Pennsylvanian fossils were first identified in those two states. Outside the United States, these two strata together are often called Carboniferous because of the high carbon content of some of their most common fossils such as coal and oil.
- Permian fossils were first found near the Russian city of Perm.
- Triassic strata are so named because geologists divided the rocks in Germany into three distinct strata.
- Jurassic rocks were named for the Jura Mountains of Europe.
- Cretaceous rocks are characterized by a high concentration of calcium carbonate, or chalk. “Creta” is the Latin word for chalk.

The strata of the Cenozoic (Greek for “recent life”) are the only ones whose names are supposed to have anything to do with time. They are identified by the suites of modern type fossils they contain. From lowest to highest on the column, the Cenozoic names mean “old recent,” “dawn of recent,” “few recent,” “less recent,” “more recent,” “most recent,” and “whole (or entirely) recent.”

## III. ADEQUACY OF THE FOSSIL RECORD.

Visual # 5-8 We noted in Chapter One that evidence may be incomplete, withheld, or falsified. Darwin was aware that incomplete evidence could lead to wrong conclusions when he published *The Origin of Species* in the middle 1800's. Though sure he was right, he admitted that “Geology assuredly does not reveal any such finely-graduated organic chain [of transitional fossils]; and this, perhaps, is the most obvious and gravest objection which can be urged against the theory.”

Visual # 5-9 (Darwin, 1966, 280) He believed that this problem was due to incomplete evidence and expected that further discoveries in paleontology would show that his theory was correct.

A century and a half later, we have many more fossils than were available to Darwin. For instance, in the Karoo Supergroup of South Africa alone, the number of vertebrate fossils is estimated at over eight hundred billion (Newell, 1959, 496). While the number in this one formation may be exaggerated, we can say without fear of contradiction that hundreds of billions of fossils have been located worldwide. These have been classified into about 250,000 species. With this much evidence, we should be able to draw some reasonable conclusions about what happened in the earth’s past.

## **A. ARGUMENTS FOR AND AGAINST INITIAL COMPLEXITY.**

### **1. ARGUMENTS FOR INITIAL COMPLEXITY.**

Visual  
# 5-10

The arguments *for* Initial Complexity do not depend only on religious belief, but also on logic. If life were developing gradually, it seems likely that there would have had to be far more transitions than terminal (final) forms. Yet of the 250,000 or so fossil species identified, at most a few dozen are even claimed to be transitions between major types. Even these are not universally accepted. (For instance, even some evolutionists reject *Tiktaalik* as a transition between fish and amphibians, and *Archaeopteryx* between reptiles and birds.) The conclusion is that the transitions were not preserved because they never existed.

### **2. ARGUMENTS AGAINST INITIAL COMPLEXITY.**

The arguments against Initial Complexity are philosophical rather than scientific. The basic premise of Initial Complexity relies on some influence outside nature, that is, some sort of God. Because there is no way to do experiments to test the existence of God, many refuse to accept the possibility that He could exert an influence on Nature. Thus, they refuse to accept the possibility of initial complexity.

## **B. ARGUMENTS FOR AND AGAINST INITIAL DISORGANIZATION: NEO-DARWINISM.**

### **1. ARGUMENTS FOR NEO-DARWINISM.**

The arguments *for* Neo-Darwinism (gradual evolution) depend on deductive logic:

Visual  
# 5-11

#### **a. Basic Presuppositions.**

Evolution must be true.

#### **b. Biological Observations.**

While offspring vary somewhat from their parents, the differences are not drastic.

#### **c. Logical Conclusion.**

Therefore, evolution must work by the slow accumulation of gradual changes.

### **2. ARGUMENTS AGAINST NEO-DARWINISM.**

On the other hand, the arguments *against* Neo-Darwinism are based on the fossil record. Out of hundreds of thousands of fossil types identified, only a few dozen are even claimed to be transitions from one major type to another. This is difficult to reconcile with the concept of gradual evolution.

Visual  
# 5-12

Some Neo-Darwinists explain the lack of transitional fossils by saying that the ancestors of the Cambrian fauna must have been too soft-bodied for the Pre-Cambrian sediments to preserve. 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 of the same chemical composition as the Cambrian rocks – which include soft-bodied forms – yet they contain no ancestors for the Cambrian creatures (Axelrod, 1958, 7). They even contain fossilized jellyfish (Hagadorn et al., 2002, 147-150. If the rocks could preserve jellyfish, it seems likely that they could preserve other soft-bodied organisms as well.

## **C. ARGUMENTS FOR AND AGAINST INITIAL DISORGANIZATION: PUNCTUATED EQUILIBRIA.**

The fossil record remains such an obvious and grave objection to Darwin's idea of gradual evolution that a newer model known as Punctuated Equilibria has gained popularity. This model says living things must have remained at equilibrium for thousands or millions of years until suddenly a punctuation event occurred – perhaps an asteroid impact, volcanic eruption, or other such major disruption in the environment. Things changed drastically

as a result. Creatures not suited to the new environment died quickly, leaving only a few of their descendants that happened to be able to adapt to the new conditions. These multiplied rapidly, filling up the ecological space. Some believe rapid transitions could have taken place in as little as a few hundred years.

### **1. ARGUMENTS FOR PUNCTUATED EQUILIBRIA.**

The arguments *for* Punctuated Equilibria depend on deductive logic:

#### **a. Basic Presuppositions.**

Evolution must be true.

#### **b. Fossil Observations.**

The extreme rarity of alleged transitional forms in the fossil record argues strongly against Neo-Darwinian (gradual) evolution.

#### **c. Logical Conclusion.**

Since Punctuated Equilibria is the only other evolutionary alternative, therefore it must be true.

That is, the only evidence *for* Punctuated Equilibria is the fact that the fossils do not furnish evidence for Neo-Darwinism.

### **2. ARGUMENTS AGAINST PUNCTUATED EQUILIBRIA.**

On the other hand, the arguments *against* Punctuated Equilibria are biological in nature.

#### **a. Mutations not known to increase genetic information.**

Some mutations may benefit individuals through the loss of features that might be harmful in specific environments. Nevertheless, no mutations are known to benefit the affected species or to increase genetic information. Yet the rapid transitions of Punctuated Equilibria would require not just one mutation but hundreds or thousands, all perfectly coordinated and working together to furnish new structures and organs with at least minimal function. As some have asked, *What good is half a wing or half an eye?*

#### **b. Extreme improbability.**

Unless the mutant found another mutant of the opposite sex to breed with, the new species would quickly become extinct. Not only would a male and female have to undergo many identical mutations, they would also have to acquire many complementary ones that produced matching changes in their reproductive systems. The mutations would be useless if the two of them never met, so they would have to live in the same place at the same time. The same type of thing would then have to happen hundreds of thousands of times to other pairs of mutants in other places and times in order to produce all the other species.

## **D. SUMMARY OF THE THREE MODELS.**

About 250,000 fossil species have been identified. At most, a few dozen have been proposed as transitions.

### **1. INITIAL COMPLEXITY.**

Initial Complexity says the transitions were not preserved because they never existed.

### **2. INITIAL DISORGANIZATION - NEO-DARWINISM.**

Neo-Darwinism says the transitions were not preserved because the process was too slow.

### **2. INITIAL DISORGANIZATION - PUNCTUATED EQUILIBRIA.**

Punctuated Equilibria says the transitions were not preserved because the process was too rapid.

The common thread is that transitions were not preserved.

#### IV. CONTRASTING BELIEFS ABOUT HOW STRATA WERE DEPOSITED.

Visual  
# 5-15

Fossil-bearing strata are composed of sedimentary rock containing mud, sand, ash, and so forth. Igneous rocks are not likely to contain fossils because an advancing lava flow would have destroyed any organisms in its path.

Most fossils are found in large numbers rather than individually. In most cases, groups or *suites* of fossils are used to identify the rock strata in which they occur.

Visual  
# 5-16

Sometimes fossils occur in large scale graveyards. These include the Lance Creek Formation of Wyoming, in which an estimated 34,000 *Edmontosaurus* skeletons are buried in water-deposited sediment; the Redwall Limestone at the Grand Canyon, with a fossil deposit estimated at several billion nautiloids; the Karoo Supergroup of South Africa, believed to contain hundreds of billions of vertebrate fossils; and many others.

##### A. INITIAL COMPLEXITY (CREATION).

Strata containing large numbers of fossils were probably formed under catastrophic conditions as sediment was deposited around the earth in violent events such as floods and volcanic ash eruptions.

The concept of Initial Complexity in itself does not require the earth to be any specific age. It could be old, or it could be young.

##### B. INITIAL DISORGANIZATION (EVOLUTION).

Visual  
# 5-17

Most science textbooks say that strata were deposited a little at a time over millions of years, then eventually consolidated into rock.

The idea that the rock layers were formed slowly, steadily, and gradually by uniform processes is called *uniformitarianism*. In other words, present processes worked in the past at the same rates they do in the present and are responsible for the earth's geologic features. This is often expressed in the statement that "The present is the key to the past." (Christians may note that this was prophesied in the Bible in 2 Peter 3:3-6.)

A key part of uniformitarianism is Steno's Law of Superposition (formulated in the late 1600's), which says that the layers on the bottom have to be the oldest. Uniformitarianism denies that there was ever a worldwide flood.

##### C. ACTUAL OBSERVATION.

###### 1. LARGE SCALE DEPOSITION AND EROSION OF STRATA IN NATURE.

Visual  
# 5-18

We have not been observing nature long enough to see strata form over millions of years. However, events such as the 1980 eruption of Mount St. Helens in the state of Washington have demonstrated that strata can be deposited in a matter of days, and can also experience a great deal of erosion in a similar time frame.

Visual  
# 5-19

As compared to most volcanoes, very little lava came out of Mt. St. Helens. Instead, superheated mud buried the surrounding countryside, as much as six hundred feet deep. The 80 mile per hour mud flowed laid down thousands of thin laminated layers. They look very much like the layers found at other places such as the Green River in Wyoming, supposed to have been deposited one at a time over millions of years. However, Mt. St. Helens laid down thousands of laminae in two days.

Among other places, the volcanic mud flowed into the North Fork of the Toutle River, burying it to a depth of about a hundred and forty feet. As the superheated mud contacted the water it produced steam explosions and formed weak spots in the hardening deposits.

Visual  
# 5-20

In the following months, snow accumulated in the volcanic cone, mixing with the volcanic ash left behind and forming a great deal more mud. Twenty months later, on March 19, 1982, a second mudflow broke through the weak spots in the first one. In

one day it carved out a network of canyons including the 140 foot deep “Engineer’s Canyon.” (Austin, 1994, 94). This is roughly one thirty-fifth the depth of the Grand Canyon.

Visual  
# 5-21

Besides the rapid erosion through soft sedimentary rock, there was also rapid erosion through *hard* rock. During the initial eruption, the volcano blasted the 700 foot deep “Step Canyon” through the solid granite of the “Goat Rocks.” Despite the uniformitarian expectation that this much erosion through granite should take at least hundreds of millions of years, it took one day.

## **2. DEPOSITION OF STRATA UNDER LABORATORY CONDITIONS.**

The so-called “Law of Superposition” has been falsified. The principle seems to work under *quiescent* conditions, that is, when the water carrying sediment is not moving. However, if the sediment-laden water is flowing, the results are quite different from what Steno expected. Large scale lab experiments by Guy Berthault and Pierre Julien at Colorado State University (Berthault, 1988, 717-724; Berthault & Julie, 2000) and later by Berthault in Russia (Berthault, 2016) show that layers formed by flowing sediment look like those formed quiescently, except that the ones on the bottom are NOT necessarily the oldest (Bernard, 2016). Since the layers form in the direction of current flow, the oldest ones are in the direction from which the current came rather than at the bottom.

Visual  
# 5-22

The eruption and later mud flows of Mt. St. Helens confirm that the principle of superposition does not apply to fast-flowing sediment. Hundreds of feet of mud deposited tens of thousands of finely laminated strata over the space of just a few days. The strata were all the same age rather than tens of thousands of years apart.

## **D. SUMMARY OF ACTUAL OBSERVATION.**

- Observations in nature and experiments in laboratory conditions have shown that strata can form rapidly under the catastrophic conditions expected in the Initial Complexity (complex-to-simple) model.
- Because the amount of time required by the Initial Disorganization (simple-to-complex) model would far exceed the lifetime of human observers, scientists have never been able to observe strata forming under uniformitarian conditions.

Since we cannot observe the prehistoric past to determine whether catastrophism or uniformitarianism is the better explanation for the geologic strata, we cannot rule out either one. Science teachers should be willing to allow students to consider both possibilities.

## **V. CONTRASTING BELIEFS ABOUT HOW FOSSILS WERE FORMED.**

Initial Complexity and Initial Disorganization present sharply contrasting beliefs about how the hundreds of billions of fossils known in the world were formed.

Visual  
# 5-23

### **A. INITIAL COMPLEXITY - RAPID BURIAL.**

Since living things came into existence in a complex condition, it did not take millions of years for them to develop into the terminal forms in the fossil record.

Animals and plants buried quickly enough could turn into fossils in a relatively short time under the right conditions. Many of the fossils probably formed fairly rapidly, largely as the result of catastrophic processes.

### **B. INITIAL DISORGANIZATION - SLOW FOSSILIZATION.**

As sediment was accumulating in bodies of water, animals and plants dying next to them fell in and were buried. The sediment eventually hardened into rock. After millions of years, the rock eroded and exposed the fossils.

### C. ACTUAL OBSERVATION - CONDITIONS NEEDED TO PRESERVE FOSSILS.

Animals and plants that die and fall into a body of water decay quickly unless they are cut off from contact with oxygen and with scavengers. However, lab experiments have shown that fossils can form in a very short time under the right conditions: (1) They must be buried quickly. (2) There must be a sufficient concentration of minerals in the surrounding soil and water. (3) They must be subjected to a great deal of heat and pressure.

Visual  
# 5-24

It is difficult to fit large scale fossil graveyards into this scenario. For instance, the Lance Creek Formation of Wyoming contains an estimated 30,000 or more *Edmontosaurus* specimens; Dinosaur National Monument contains thousands of dinosaurs; and the Karoo Supergroup of South Africa contains an estimated tens of billions of amphibians. It would be unlikely for them to die and fall into a river or lake one at a time to be later preserved as fossils.

#### 1. FOSSILIZED BONES IN LAB EXPERIMENTS.

Researchers have been able to turn chicken bones into mineralized fossils in five to ten years under laboratory conditions (I. Taylor, 1987, 28). Experiments on bones, beetles, and resin have cut the time needed down to about a single day (Saitta, 2018).

Visual  
# 5-25

#### 2. OIL.

Crude oil is commonly referred to as fossil fuel because it contains the remains of plants and animals supposed to have died millions of years ago. However, lab experiments under high pressure and temperature conditions have converted cow manure to a good grade of crude oil in twenty minutes, not millions of years (Whitcomb, 1973, 124). (This is not the solution to the world's energy needs. Most of the energy applied is wasted, radiating out into the atmosphere in the form of useless heat.)

#### 3. RAPID MINERALIZATION.

It does not take much time for objects to become completely encrusted in minerals. For example, spark plugs are often used as fishing sinkers in the harbor in Durban, South Africa. Sometimes the lines break and the spark plugs are left on the bottom. The water has such a high concentration of minerals that they become coated and look like fossils in just a few years (Author's personal experience, Durban).

### D. SUMMARY OF ACTUAL OBSERVATION.

- Observations in nature and experiments in laboratory conditions have shown that fossils can form rapidly under the catastrophic conditions expected in the Initial Complexity (complex-to-simple) model.
- Because the amount of time required by the Initial Disorganization (simple-to-complex) model would far exceed the lifetime of human observers, scientists have never been able to observe fossils forming under uniformitarian conditions.

Since we cannot observe the prehistoric past to determine whether catastrophism or uniformitarianism is the better explanation for the fossil record, we cannot rule out either one. Science teachers should be willing to allow students to consider both possibilities.

## VI. CONTRASTING INTERPRETATIONS OF THE ROCK STRATA.

Though there is nowhere in the world where all the geologic strata occur together, they have been arranged into a hypothetical sequence known as the geologic column. As we saw earlier, this sequence is divided into several dozen eras, periods, and epochs. Each geologic stratum is assigned an age determined by the characteristic suite of fossils it contains.

Though everyone looks at the same strata and fossils, not everyone interprets them the same way. The geologic column found in textbooks is arranged according to the simple-to-complex model.

Visual  
# 5-26



## **A. INITIAL COMPLEXITY - Strata represent ecological Communities.**

Visual  
# 5-27

Life began in a complex condition. All of the higher taxa of animals and plants were present from the beginning, though they may not all have been preserved as fossils. There should be many representatives of the major types in the lowest fossil-bearing layers.

Visual  
# 5-28

The fossil record should indicate that animals and plants in the past lived in interdependent ecological communities or *biomes* just as they do today. Strata should show clear cut worldwide patterns of fossil distribution indicating distinct communities.

This is not to say that the fossil suites discovered one on top of another lived in that sequence. Rather, the conditions at the time of burial would have been such that the first group was buried, than later the second was swept from some other area and deposited on top of the first, and so on.

The majority of fossils were probably formed under catastrophic conditions such as floods or volcanic mud or ash flows. Such conditions lead to unpredictable results. (See Appendix C for a possible global flood scenario as to how strata might have been deposited in such a manner.)

## **B. INITIAL DISORGANIZATION - Strata represent time periods.**

Visual  
# 5-29

Life began in a disorganized condition. The first living thing belonged to only one kingdom, phylum, class, order, and so on. As time went on, its descendants diversified into more and more different types. They should increase in complexity higher in the geologic column.

Strata represent time periods. Since the simplest fossils would have had to evolve before the more complex, they are the oldest.

There has never been a worldwide Flood. The rock strata and the fossils were laid down by uniformitarian processes, slowly and gradually at uniform rates. In general, the lower the rock, the older it is.

Since the mutations that caused living things to evolve were random, they would have evolved at different rates at different times and in different places. There should not be any clearly defined worldwide patterns in their distribution.

## **C. ACTUAL OBSERVATION.**

### **1. STRATA IDENTIFIED BY SUITES OF FOSSILS.**

Visual  
# 5-30

Geologists identify each layer (Cambrian, Ordovician, Devonian, etc.) by a clearly defined suite of fossils that is essentially the same no matter where in the world we find it. The age of the fossils is determined by the rocks in which they occur, and the age of the rocks (its *stratigraphic* age) is determined by the fossils they contain.

Stratigraphic ages are based on the belief that evolution occurred, rather than any testable method such as radioactivity. Derek Ager, past President of the British Geological Association, says he "can think of no cases of radioactive decay being used to date fossils," and fossils "have been and still are the best and most accurate method of dating and correlating the rocks in which they occur." (Ager, 1976, 425)

### **2. MISSING OR OUT OF SEQUENCE STRATA.**

Visual  
# 5-31

The single most complete portion of the geologic column is found at the Grand Canyon, which includes Precambrian (Archeozoic) sediments and five strata from the Paleozoic: Cambrian, Devonian, Mississippian, Pennsylvanian, and Permian. The layers go directly from Cambrian to Devonian, skipping the Ordovician and Silurian. This represents a gap of at least 70 million years on the geologic time scale.

There are many other places around the world where strata are missing. There are also hundreds of well documented cases where strata occur in the wrong order, i.e., those that are supposed to be older are on top of those considered younger.

Visual  
# 5-32

### **3. STRATIGRAPHIC LEVEL OF FOSSILS SUPPOSED TO BE THE OLDEST.**

Almost all who accept the idea of Initial Disorganization believe in some variant of the Oparin-Haldane Hypothesis for the origin of life. As we saw in Chapter Three, this hypothesis says that a mixture of gases containing the elements needed for life must have been exposed to some energy source that enabled them to come together into amino acids, proteins, and cells. As Darwin wrote in a letter to his friend Joseph Hooker, life must have begun in some “warm little pond.” (Darwin, 1871). Since there are no ponds at the bottom of the ocean, this would have had to take place around sea level.

A problem with this scenario: the fossils supposed to be the oldest, those of the Archeozoic (dated a billion years or older), are bottom-dwelling sea creatures. According to the simple-to-complex model, the earliest organisms would have had to (1) come alive at sea level, (2) swim miles down to the bottom of the ocean, then (3) evolve higher and higher in the geologic column until they got back to sea level and beyond. However, textbooks generally ignore the question of *How did they survive the original dive from sea level to the bottom of the ocean?*

#### **D. SUMMARY OF INTERPRETATIONS.**

We cannot experiment on the past so as to directly observe it. However, we can draw some logical inferences.

- The concept of initial complexity is completely compatible with the idea of using suites of fossils to identify strata.
- Initial Disorganization does not lead us to predict the existence of clearly defined suites of fossils. Instead, it would lead us to expect random distribution of types in different strata around the world. It requires a great deal of explanation to reconcile the suites of fossils with Initial Disorganization.

Visual  
# 5-33

## **VII. EXPECTED CHARACTERISTICS OF THE FOSSIL RECORD.**

If we assume for the sake of argument that the strata of the geologic column represent time periods rather than ecological communities, the assumptions of initial complexity versus initial disorganization lead us to make specific predictions about what we should find in the fossil record.

### **A. INITIAL COMPLEXITY.**

#### **1. SUDDEN APPEARANCE OF TERMINAL FORMS.**

Since each basic type of creature appeared in a complex, fully functional condition, the first representative of each type in the fossil record should appear suddenly with no transitions leading up to it.

#### **2. STASIS.**

Since each basic type of creature was brought into existence in a complex, fully functional condition, there should be a resistance to basic change. The fossils found at the lowest level should be recognizable as the same basic type all the way to the present or, if extinct, to the highest levels in which they occur.

### **B1. INITIAL DISORGANIZATION - Neo-Darwinism.**

#### **1. GRADUAL DEVELOPMENT OF TERMINAL FORMS.**

The first living cell came into existence from lifeless chemicals over three billion years ago. Ever since then, its descendants have been evolving into more and more complex types. There would have had to be many more transitions than there would be terminal forms.

#### **2. CONTINUAL GRADUAL CHANGE.**

Once the first recognizable terminal form of each type appeared, there would be no

Visual  
# 5-34

Visual  
# 5-35

reason for its descendants to stop evolving. The fossil record should show continual gradual change.

## **B2. INITIAL DISORGANIZATION - Punctuated Equilibria.**

The Punctuated Equilibria model was proposed precisely because of the sudden appearance and stasis evident in the fossil record. Punctuacionists reject the Initial Complexity model because it requires some influence outside nature.

### **1. STASIS.**

Punctuacionists believe that the fossils indicate stasis because they were in periods of *equilibrium* for millions of years.

### **2. SUDDEN APPEARANCE.**

The equilibria ended when sudden *punctuation* events such as floods, volcanic eruptions, or asteroid impacts radically changed the environment. New types evolved rapidly as a result of the altered natural selection pressure. Since it was such a quick process, very few fossils of the transitional stages were formed. Once the punctuation event was over, stasis resumed.

## **C. ACTUAL OBSERVATION.**

### **1. SUDDEN APPEARANCE OF TERMINAL FORMS.**

The reason Punctuated Equilibria has gained acceptance is that two of the most obvious characteristics of the fossil record are stasis and sudden appearance (Gould, 1977, 14). Several of the many well-known examples:

#### **a. The Ediacaran Fauna.**

Pre-Cambrian times are supposed to have lasted about four billion years. During this time, the fossil record consists mainly of (1) blue-green algae, (2) disputed “microorganisms” which may not be traces of living creatures at all, and (3) a group of complex invertebrates called the Ediacaran Fauna.

The Ediacaran fossils are a Pre-Cambrian suite named for the the Ediacara Hills of Australia, where they were first discovered. They have since been found in 30 locations on five different continents. Over 1,500 specimens representing at least 60 species and 30 genera have been discovered so far (Windley, 2019). They include invertebrates such as corals, jellyfish, and segmented worms, but are not considered ancestors of later corals, jellyfish, or worms (Gould, 1984, 14-23) because there are significant anatomical differences between them and their counterparts dated to later geologic ages.

#### **i. 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. 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 them to undergo such a radical reversal rule them out as ancestral jellyfish.

#### **ii. Corals.**

Ediacaran corals look superficially like modern soft corals, yet are significantly different. Modern varieties have separate branches that allow water to reach the individual members of the colony in order to bring oxygen and nutrients. However, Ediacaran corals form a continuous quilted structure, not separate branches like modern ones. The mechanism for supplying oxygen and nutrition

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to individual members of the colony is radically different.

*i. Worms.*

Ediacaran worms are segmented and symmetrical like many worms from other geologic “ages” but are flat rather than round. 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 appeared suddenly and fully formed then became extinct without leaving descendants.

***b. Sudden appearance of many higher taxa - the Cambrian Explosion.***

Plants and animals should have been going through vast numbers of evolutionary stages during the four billion or so years of Pre-Cambrian time. However, these stages are not documented by fossil evidence. Suddenly in the Cambrian, representatives of *all the phyla* of the animal kingdom, as well as many divisions of plants, appeared with no known ancestors. They already have their ordinal characters clearly defined. Their appearance is so dramatic that geologists call this the “Cambrian Explosion.” No known transitional forms lead up to them from any Pre-Cambrian forms. Many are only found in the Cambrian. They disappear and are not found in higher strata, presumably due to extinction

The Cambrian fauna are quite complex, even including a few vertebrates, fish of **Class Agnatha** (Repetski, 1978, 529; Shu et al., 2003). However, the number of fish discovered so far is small. Initial Disorganization says vertebrate fish had not evolved yet, but Initial Complexity says they were simply able to avoid being buried a longer time.

- Except for fish, most creatures living at the bottom of the ocean are not very mobile. They would likely have been buried first in some sort of catastrophic event. The lowest fossils should generally be those that were fairly dense and were not very mobile.
- Since fish are present in the lowest ocean biomes today, they were probably there from the beginning. However, they are much more mobile than bottom-dwelling invertebrates. They would have been able to escape being buried longer than the invertebrates, though a few fish might be buried in the lowest strata.
- The Pre-Cambrian through Devonian strata represent oceanic biomes at shallower and shallower depths. As catastrophic sediment deposition continued, more and more fish would have been unable to continue to escape being buried. All the animals found so far are types we would expect to find in the sea. However, numerous sources (Leclerq, 1956, 109-114; Axelrod, 1959; Weisz & Fuller, 1962; Weier et al., 1974; Strother, 2000, 3-19) have reported the discovery of spores and other parts of **land plants** in Cambrian rocks. Since land plants are not supposed to have evolved until perhaps a hundred million years after the Cambrian was ended, this is difficult for Initial Disorganization to account for. The plant fossils are a hundred million years too early.
- Proponents of Initial Disorganization try to explain away the plant fossils by saying that unknown geologic processes reworked them downward through the rocks so that they wound up on the bottom.
- Those who support the idea of Initial Complexity believe that strata were often formed under catastrophic conditions. Since the Cambrian fossils are buried in

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water-deposited sediment, it would make sense that they 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 catastrophic deposition of sediment. And since catastrophic conditions would have caused a great deal of churning, it would not be surprising to find plants occasionally mixed in with animals outside their normal biome because of violent water action.

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The modern oceans contain a great deal of diversity, but the variety of modern creatures pales in comparison to the Cambrian Explosion. Why is there no fossil record of their ancestors to the Cambrian fossils? Besides the idea of their being lost or reworked, it is also possible that they were not fossilized because they did not exist.

**c. Explosive appearance of mammals in the Cenozoic Era.**

The sudden appearances of the Ediacaran and Cambrian animals and plants are not isolated cases. Most types of mammals are also considered to have appeared explosively.

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We can tell the difference between reptiles and mammals by their bone structure. The same is true when studying different types of mammals. Five orders of mammals are known from the Mesozoic, but only one type of fossil, *Morganucodon*, has been proposed to represent the transition from reptiles. None have been proposed as transitions between the five mammalian orders of the Mesozoic.

**i. Simple-to-Complex Scenario.**

One of the most common ways of grouping mammals divides them into 32 orders. None of these are known from layers below the Triassic. Moving up the geologic column to the Mesozoic (Triassic, Jurassic, and Cretaceous, supposed to have lasted about 100 million years), we find specimens of only five of the 32 orders. These orders do not display any visible evolutionary development from the lower to the upper layers. Then, moving up to the Paleogene (the beginning of the Cenozoic), the other twenty-seven mammalian orders appeared, supposedly within the space of about 12 million years (Agadjanian, 2003, 179-186) Initial Disorganization says they evolved by natural selection operating on minor mutations.

In geologic terms, the appearance of twenty-seven orders within a few million years would be considered explosive. Paleobiologist Steven Stanley says that this “is clearly preposterous.” (Stanley, 1981) He believes that if evolution really did occur slowly and gradually as Neo-Darwinism postulates, it would have taken far more than twelve million years to produce the assortment of mammals we see both living and fossilized. Instead, he believes Punctuated Equilibria furnishes a better explanation.

As noted above, there are no proposed transitions between the five orders of Mesozoic mammals. Nor do we know of any ancestors for the other 27 orders first found in the Cenozoic. All 32 show the same characteristics: sudden appearance with no known ancestry and no known connection to any other order (Simpson, 1944, 105).

**ii. Complex-to-Simple Scenario.**

Initial Complexity, on the other hand, says the strata represent ecological communities. The Mesozoic, during which the first five orders of mammals lived, is known as the “Age of Reptiles.” Even in the present day we see that

some mammals such as rats and mice are able to exist in environments that would kill most others. We can speculate that the five Mesozoic orders (small rodent-type mammals) might have been the types that could have survived in an environment particularly suitable for reptiles.

Since Initial Complexity says that the strata represent ecological communities, it would imply that the twenty-seven orders that became known in the Cenozoic already existed, but had simply not yet been buried and fossilized in lower layers.

## 2. STASIS.

As mentioned previously, one of the main reasons for the Punctuated Equilibria model is that the fossil record demonstrates both sudden appearance and stasis. That is, every type of fossil appears suddenly and remains static from its lowest appearance to the highest or until the present.

There are also dozens of examples of “living fossils” that have not changed from their first appearance as fossils until the present. Blue-green algae do not seem to have evolved in over 3.5 billion years; priapulid worms similar to *Ottoia* are dated 508 million years ago (Hearing, 2017); horseshoe crabs are the same as they were supposedly over 445 million years ago (MA); shrimp, 400 MA; lampreys (suckerfish), 360 MA; coelacanths (supposed to be the transition from fish to land animals), 350 MA; platypuses, 160 MA; crocodiles, 160 MA; and many other well-known examples.

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## VIII. CHAPTER SUMMARY.

The question of who or what is responsible for life, what it all means, and similar topics are religious. However, the question of what the conditions have been throughout the history of life can be approached in a non-religious way.

Fossils give us the only tangible evidence of what has happened throughout the history of life. Since we cannot do experiments on the past, we are limited to using logic to determine which idea about the history of life is more likely to be correct. The two main concepts are: Initial Complexity (creation apart from its religious implications) and Initial Disorganization (evolution apart from its religious implications).

The fossil record contains hundreds of billions of fossils, enough to allow us to draw reasonable conclusions.

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<p><b>A. EXPECTATIONS OF INITIAL COMPLEXITY.</b></p> <p>The overall trend in the history of life is from complex to simple.</p> <ol style="list-style-type: none"> <li>1. Initial Complexity includes the idea that much of the earth’s geologic record was formed rapidly under conditions best described as catastrophic.</li> <li>2. The great majority of fossils were formed under catastrophic conditions.</li> <li>3. Geologic strata around the world are</li> </ol>	<p><b>B. EXPECTATIONS OF INITIAL DISORGANIZATION.</b></p> <p>The overall trend in the history of life is from simple to complex.</p> <ol style="list-style-type: none"> <li>1. Initial Disorganization leads us to believe that much of the earth’s geologic record was formed slowly, steadily, and gradually under uniformitarian conditions.</li> <li>2. Likewise, the great majority of fossils were formed under uniformitarian conditions.</li> <li>3. Geologic strata represent time periods.</li> </ol>
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