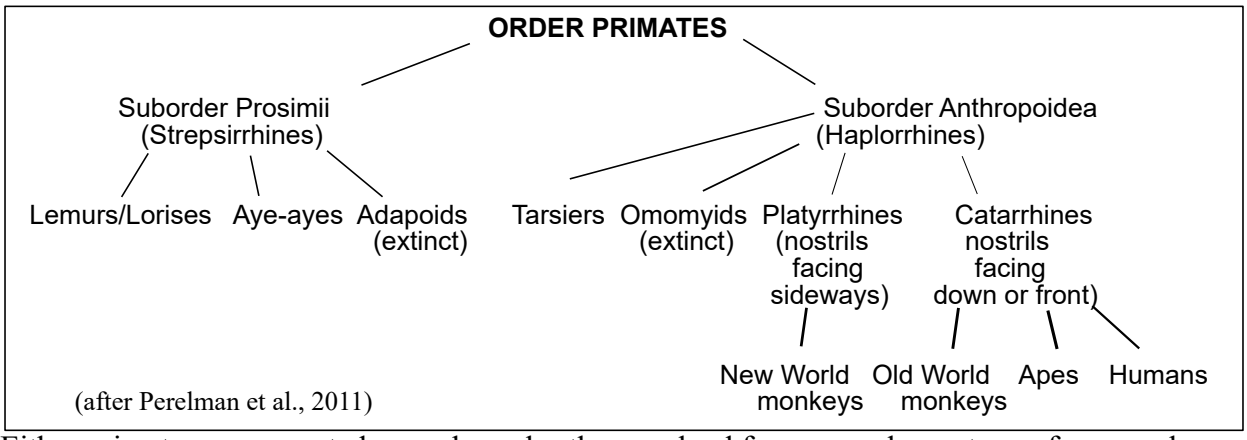
CHAPTER 10 - WHY SO MANY SPECIES AND GENUS NAMES FOR FOSSIL PRIMATES?

There are many other orders of mammals, but this chapter will focus on the type most pertinent to the question of whether we humans evolved from some lower life forms. Along with monkeys, apes, lemurs, lorises and similar types, humans are classified as members of Order Primates. In the Linnaean system, the order is broken down as follows.

Visual #10-1



Visual #10-2

Either primates were created as such or else they evolved from some lower type of mammal.

The number of fossils of prosimians, monkeys, and apes is relatively small, consisting primarily of fragments such as teeth. Nevertheless, there are a relatively large number of species and genus names applied to primates.

I. BASIC BELIEFS OF INITIAL COMPLEXITY VS. INITIAL DISORGANIZATION.

Visual #10-3

The concept of creation includes the idea that the universe, earth, and life were brought into existence in an initially complex condition as a result of unknown processes. Later changes would be in the direction of overall deterioration, i.e., a tendency toward randomness. A great deal of diversification would be available in living things, but would be limited by the amount of genetic information present at the beginning.

The concept of evolution includes the idea that the universe, earth, and life were brought into existence in an initially disorganized condition as a result of unknown processes. Later changes would be in the direction of overall organization and increasing information content. e.g., a tendency *away from* randomness. Diversification in living things would add a great deal of genetic information to whatever was present at the beginning.

There is nowhere in the world where all the geologic strata occur together. Nevertheless, they have been arranged according to the simple-to-complex model into a hypothetical sequence known as the geologic column. The column is subdivided into several dozen eras, periods, and epochs. Each geologic stratum is assigned an age determined by the characteristic suite of fossils it contains.

A. INITIAL COMPLEXITY - Strata represent ecological Communities.

Visual #10-4

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.

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.

The fossil suites discovered one on top of another did not necessarily live 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 including but not limited to flooding conditions or volcanic mud or ash flows. Such conditions lead to unpredictable results.

B. INITIAL DISORGANIZATION - Strata represent time periods.

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.

Visual #10-5

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.

The great majority of textbooks and scientists present students with only the latter. Since their belief in uniformitarianism and long ages is foundational to evolution, if there really was a worldwide flood they are wrong.

II. WHY WOULD ANYTHING EVOLVE?

A. USE AND DISUSE OF BODY PARTS vs. MUTATIONS.

In the early 1800s, Lamarck proposed that as body structures in animals were built up through use or atrophied through disuse, the changed would be passed on to the next generation. This belief has been thoroughly falsified by experimentation. Physical features acquired, lost, or modified through use and disuse of body parts cannot be passed on to the next generation. Nevertheless, the idea still seems to underlie many hypotheses. For instance, some (e.g., Boyer et al., 2017, 203-212) believe that the bone structures of early primates were shaped by leaping vs. climbing behavior. This is plausible in an individual, but it would have no effect on future generations. Any individuals that forced their bone structures to change by leaping or climbing would not pass the modifications on because their DNA would not be changed.

Visual #10-6

Ignoring the question of how some primitive Mesozoic mammal acquired its genetic information in the first place, the DNA would need to undergo at least thousands of mutations in order for it to evolve into primates. The error correcting mechanisms would have to allow thousands of beneficial mutations to slip through uncorrected. Each set of mutations would have to build on the previous ones, with each transition allowing the animals to stay alive despite the major structural changes taking place.

No known mutations have ever increased the amount of genetic information in DNA. Nevertheless, the mutations in the line evolving into primates would have had to add a great deal of beneficial information to the evolving animals. The accumulation of so many mutations would almost certainly not happen in a single generation. Thus, it is reasonable to expect that at least a few of the transitional stages would be preserved as fossils.

B. NEED FOR PARALLEL AND COMPLEMENTARY MUTATIONS.

Like all mammals, primates reproduce sexually. Thus, each evolving type would have had to come from predecessors in which one or more males acquired a significant number of mutations leading in the direction of the new type. However, mutations are almost always recessive. Thus, in order for new features to be expressed in offspring, one or more females

Visual #10-7

at the same time and place would have had to acquire a significant number of mutations that were the same as those of the males.

Acquiring only identical mutations would not be be sufficient, though. Each type of monkey or ape can only breed with those of its own type. The error correcting mechanisms of each new evolving type would have to allow a significant number of complementary mutations to slip through in one or more males and one or more females at the same time and place so that the reproductive systems would still be able to function together. This process would have to repeat for each step of the evolution of the primates.

III. DIFFICULTY IN CLASSIFYING FOSSILS.

It is often difficult to determine whether two or more fossils consisting of a few fragments represent the same species or genus. Biologists define a species as a group whose members can breed only with each other, but sometimes individuals within the same genus but belonging to different species can breed together. Examples would be lions (*Panthera leo*) with tigers (*Panthera tigris*), lions with leopards (*Panthera pardus*), and jaguars (*Panthera onca*) with leopards. Likewise, through artificial insemination the smallest miniature horses are able to able to breed with the largest such as Clydesdales and Percherons.

Visual #10-8

Since we can do breeding experiments on living animals, it is easy to determine whether they belong to the same species. However, there is no way to perform breeding experiments on extinct animals. Paleontologists must simply take educated guesses about whether two fossils represent the same species or even genus. In many cases, they are working with such fragmentary material, e.g., a single tooth (Smith et al., 2006, 11223), that it is difficult to be confident about their conclusions until more material becomes available. In at least one case, an upper and lower jaw were placed in two separate genera until paleontologists realized they belonged to the same species (Simons, 1997, 184).

A. PRIMATE FOSSIL RECORD COMPARED TO POPULATION GROWTH.

The human population has grown exponentially since we have been keeping track of the number of people in the world. Between 1804 and 2022 (only 128 years) the United Nations estimates that the number of humans grew from about one billion to 8.3 billion or so.

Visual #10-9

If primates have really existed for 55,000,000 years or more (since the Eocene), there would have been over 429,000 times as long a span as the time between the above population estimates. Since there have been billions of humans, it seems likely that there should have been billions of lower primates and millions of transitions between types. Yet their fossils are few and far between. There are a handful of nearly complete fossils of prosimians such as lemurs, but not a **single 100% complete specimen** of monkeys or any higher primates (ape or alleged human ancestor) lower than Neanderthal Man. Rather than numbering in the millions, the number of genera of proposed fossil transitions is at most only a few hundred. Those shown in museums and books are almost always composites of disarticulated bones rather than complete animals.

The lack of transitional types could be explained several ways.

- Evolution says that fossilization of an animal is a matter of chance. It is purely accidental that such a small number of transitional forms were preserved.

Visual #10-10

- Biblical creation says that there was a worldwide flood. Animals that were the most mobile and intelligent would have been able to avoid burial longer and would be less likely to be fossilized.

B. SCARCITY OF PRIMATE FOSSILS.

If fossils form by slow, gradual, uniform processes over millions of years then erode away as they come to the surface, the most recent creatures should have the best fossil record. They do not. Primate fossils most often consist of teeth, sometimes associated with frag-

ments of skulls or jaws. There are occasionally a few pieces of other bones, but even then the fossils are almost always broken apart (disarticulated). They are almost always buried in water deposited sediment.

The scarcity of fossils is apparent for lower primates, but even more so for hominoids (apes) and hominids/hominins (the lines supposed to lead to humans). Nevertheless, despite the lack of transitions leading up to each type, elaborate "family trees" have been constructed. As Gillette (1943) put it, these trees

> "are empty forms which consist of nothing but assumed roots, trunk, many limbs which grow in number through the years, and human twigs terminating the trunk which are supposed to connect with the assumed roots... Biologists are, of course, confessedly evolutionists, but it is really remarkable how little evidence they admit in support of their position."

Things have not changed much since then. Reader wrote (1981) that all the fossils of alleged human ancestors known today "would barely cover a billiard table." Commenting on the trees drawn to show man's evolution, he says,

Visual #10-11

> "Ever since Darwin's work inspired the notion that fossils linking modern man and extinct ancestor would provide the most convincing proof of human evolution, preconceptions have led evidence by the nose in the study of fossil man."

Science Digest's Lyell Watson (1982) tells us that

> "...all the physical evidence we have for human evolution can still be placed, with room to spare, inside a single coffin."

Dorfman (1984) agrees:

> "For all their painstaking efforts to trace the origins of man, paleoanthropologists have collected only a few thousand bones, representing 30 million years of hominoid [ape and human] evolution."

Paleontologists have been working diligently in the decades since those statements and have probably found several thousand extra bones. Perhaps they would now fill two coffins or cover two billiard tables.

Some of the most complete subhuman primate skeletons are:

Visual #10-12

- The Eocene prosimian *Darwinius masillae*, discovered crushed but recognizable in a gravel pit at Messel, Germany;
- The Eocene adapiform *Notharctus*, discovered in Wyoming;
- A single almost complete but disarticulated Pleistocene skeleton found with modern animals designated IGC-UFMG 05, attributed to *Caipora bambuiorum* in Bahia, Brazil, twice the size of any living New World monkey but similar to spider monkeys (Cartelle & Hartwig, 1996);
- A single fairly complete (though badly damaged and broken into pieces) skeleton of the tiny Chinese Eocene tarsier-like *Archicebus* (Ni et al., 2013).

There have undoubtedly been billions of primates in the world so far, but we have only a handful of complete skeletons of any primate from strata lower than the Pleistocene, in which Neanderthals are found. The elaborate family trees constructed to show our evolution are based on only a few thousand disarticulated bones, which may represent only a few dozen or hundred individuals.

There are two contradictory explanations for the scarcity of primate fossils, neither of which can be tested:

1. **INITIAL COMPLEXITY: Lack of Fossils is due to Catastrophic Conditions.**

Visual #10-13

Rapid, catastrophic events (such as a global flood) were responsible for much of the fossil record. Large numbers of animals and plants could be killed, ripped apart by tur-

bulence, and buried under massive sedimentary layers within a short time.

Rather than representing time periods, suites of fossils found together most likely represent ecological communities buried together under catastrophic circumstances. The communities in the sea (Cambrian through Devonian) would be most likely to be buried and fossilized. Those around sea level (Carboniferous and perhaps Permian) would have a good chance of being fossilized also.

The land-based biomes would be less likely to be buried in their original locations. As the flood waters were rising, the most mobile and resourceful creatures, such as primates, would probably be able to escape death for the longest time and would be less likely to be trapped in sediment. Thus, they would leave fewer fossils, and even those would tend to be isolated.

2. **INITIAL DISORGANIZATION: Lack of Fossils is due to Accident.**
Initial Disorganization includes the uniformitarian idea that geologic processes always happen at slow, steady, uniform rates. Fossils are formed when animals or plants die and fall into a body of water a few at a time, then are gradually covered in sediment. The sediment turns into rock over millions of years, then erodes away to expose the fossils. The suites of fossils represent time periods. The scarcity of primate fossils is purely accidental. The animals were not in the right place at the right time to be fossilized.

C. LUMPERS VS. SPLITTERS.

Visual #10-14

Some paleontologists are "lumpers" who recognize that there can be a great deal of individual difference between two members of a species, but many others are "splitters" and assign a different species or even genus name to each fossil fragment. "Splitters" have often been responsible for multiple names for the same genus or even the same species. However, there is often disagreement about the number of genera and species of Miocene through Pleistocene apes and humans. Creationists tend to be "lumpers" (except perhaps in a few cases such as *Homo erectus*), whereas evolutionists tend to be "splitters."

D. SPECIES AND SPECIATION.

Visual #10-15

The most common understanding of "species" is a group whose members are capable of reproducing only with each other to produce fertile offspring. The word "speciation" means the development of a new species from a previously existing group, known as a *founder population*. Evolutionists believe this has happened many times by the addition of new genes through mutation or duplication, whereas creationists generally believe it happens by the elimination of dominant genes that render individuals ill-fitted to a particular environment.

- Crossbreeding of different species belonging to the same genus produces hybrids that seem to be closer to the original condition of the animals or plants.

  The characteristics available to each group (the phenotype) are produced by a subset of the genes in their DNA (the genotype). Initial Complexity says that though the genes may have been damaged by mutation, they were present in the original ancestors of the group. Initial Disorganization, on the other hand, says that ever since the first cell came to life billions of years ago, new genes have been developing as mutations accumulated in the increasingly complex DNA of evolving organisms.
- Speciation produces opposite results from crossbreeding. It occurs when the population separates into groups that have enough differences to either thrive or do poorly in a particular environment. If they do poorly enough, they may die off.

> "Species" is a manmade concept and should not be confused with the undefined "kinds" of the creation account in Genesis. A kind might have been at the species or genus level and perhaps even as high as the family.

E. INDIVIDUAL VARIATION.

Visual #10-16

There can be considerable variation within individuals belonging to any species. For instance, the wrestler Andre the Giant (well known for the movie "The Princess Bride") was about 7 ft 4 inches (88 inches) and 500 pounds. By contrast, Verne Troyer ("Mini-Me" in the Austin Powers movies) stands about 2 ft 8 inches (32 in) and weighs 36 lbs. Andre was almost 3 times as tall and weighed almost 14 times as much. If all we had were bones to go by, we might believe they were different species or even different genera.

Fossils also show a great deal of variation. In many cases we have only a small number of complete skeletons. As we will see in the next few chapters, descriptions are often based on teeth and a few bone or jaw fragments. Since we cannot do breeding experiments on bones, there is no way to be sure our classifications are correct.

F. NATURAL SELECTION.

In the modern world, the same species or genera of animals and plants may be found in different geographic areas, but with variations.

> This phenomenon, known as *biogeography*, is considered one of the four pillars of evolution.

In nature this usually happens for one of two reasons.

1. DISTANCE.

Roaches, for example, live almost everywhere. However, those in the western United States are somewhat different from those in the east. Distance has kept the two groups from interbreeding, allowing them to develop visible differences.

2. NATURAL BARRIERS.

Visual #10-17

The squirrels on the north and south rims of the Grand Canyon belong to the same species, yet have visible differences. For instance, those on one side have lost the ability to produce non-tufted ears, while those on the other side do not have the genes to produce tufted ones. These have arisen because the two populations of squirrels cannot get across the canyon to breed with each other.

Many other species show similar types of variation. In extreme cases, group may specialize so much that they are no longer able to interbreed and are therefore classified as separate species. This process, known as *allopatric speciation*, has nothing to do with evolution. Not only have the groups failed to develop any new features, they do not even have all of the characteristics of the original ancestors. They have lost some of the original genetic information. Their inability to interbreed may be related to the loss of other genes with no obvious relation to reproduction.

3. EXAMPLE: SPECIATION OF LARGE CATS.

All cats are classified in the same family Felidae. The five largest cats, the only ones able to roar, are lions, tigers, panthers (including jaguars), leopards, and snow leopards, They all belong to the subfamily Pantherinae and genus *Panthera*.

> The other living cats are classified in the subfamily Felinae. These include domestic cats (*Felis*), mountain lions (*Puma*), cheetahs (*Acinonyx*), American spotted cats (*Leopardus*) such as ocelots, lynxes (*Lynx*), Asian spotted cats, (*Prionailurus*), caracals (*Caracal*), SE Asian marbled cats (*Pardofelis*), and clouded leopards (*Neofelis*). African wildcats (*Felis lybica*) are presently known to live only in sub-Saharan Africa and part of India.

The roaring cats above, first seen in late Pliocene and early Pleistocene strata, are commonly accepted as having descended from the extinct cave lion *Panthera spelaea* (Mazák et al., 2011; Sotnikova & Foronova, 2014; Marciszak et al., 2023). However, au-

thors of a recently published study (Tseng et al., 2013) describe a new fossil attributed to *P. blytheae* dated to the Pliocene. No human observers recorded whether the five living types developed from an unknown founder population such as *P. blytheae* or *P. spelaea* or whether one of the living species was the founder for the other four. Nor did any observers record what the circumstances were that led them to specialize into forms suited to particular environments. Regardless, the genus did not evolve any new features but instead its members specialized to particular ecological niches. For instance,

Visual #10-18

- Snow leopards (*P. uncia*) seem to be the only members of *Panthera* able to tolerate extreme cold, though a subspecies of tigers, the Siberian tiger (*P. tigris altaica*), survives under less extreme conditions.
- Lions (*P. leo*) tend to thrive in a hot grasslands environment. They are not nearly as good at climbing as some of the jungle species, but they do not need to be. Their tawny coloration serves as camouflage, whereas the spotted and striped cats would be easily visible in a savannah environment.
- Tigers (*P. tigris*), leopards (*P. pardus*), and jaguars (*P. onca*) are proficient climbers and swimmers. Tigers and leopards can live in the same forest/jungle environment, in which their stripes and spots serve as camouflage. Jaguars occupy a similar environment, though separated from the others by the oceans.

4. EXAMPLE: GALAPAGOS FINCHES

The Galapagos Islands are noted for the fact that they were the location where Charles Darwin put together some of his major ideas about evolution. The chain includes 13 main islands and 48 lesser islets, located about 600 miles off the Pacific coast of Ecuador. The total land area is just under 4900 square miles, about 3/4 that of Hawaii. Because the chain is hundreds of miles from the mainland and the individual islands are separated from each other, this is an excellent place to observe exactly the kind of specialization described above.

Some of the best-known animals of the Galapagos are the finches, with many different beak shapes, body sizes, and so on. Some have classified them into thirteen different species and up to six genera based on these differences. This is incorrect. Since at least some of the "species" are able to interbreed (White, 2002; Grant, 1992), they are not separate species but variants of a few or even one species.

Visual #10-19

Each variety of bird has a beak shape best suited for eating specific types of seeds. Since not all seed types are found on every island, the assortment of birds on each island varies a bit from the others. In addition, when the supply of any given seed type changes due to environmental circumstances such as weather, the finches with beaks matched to the seeds on a particular island are affected.

Some trees are more susceptible to reduced rainfall than others. In times of drought they tend to produce fewer seeds and may even die off. This results in varying percentages of each beak shape on each island, and therefore within the finch population as a whole. If enough individuals with large or small beaks die off, they may be eliminated from a particular island. (The genes they carry will probably also become less frequent, as happened in the aforementioned elephants.) Even if they do not all die, the overall average beak size becomes larger or smaller. However, when the circumstances change back, so do the percentages and the average beak size.

a. Simplified hypothetical example of how specialization could happen in nature.

Speciation is the development of separate species from a previously existing group. The phenomenon could just as well be called specialization, as illustrated in the following greatly simplified example.

Visual #10-20

Imagine a group of birds with two varieties, one with straight beaks and the other with curved beaks. For the sake of illustration, let us assume that there are just two alleles that control the beak shape, the "B" gene (straight beaks) and the "b" gene (curved beaks). Let us also assume that the B gene is dominant. If the starting (founder) population has both the dominant and recessive genes, they can pass on one of four combinations to their offspring, as follows:

Gene from Father	Gene from Mother	Visible Result
B	B	BB - Straight beak
B	b	Bb - Straight beak
b	B	bB - Straight beak
b	b	bb - Curved beak

Since "b" is recessive, on average only one out of four babies will have a curved beak.

Suppose these birds live on an island fifty miles long and one mile wide with a dormant volcano in the center. On the island are two kinds of trees, one with seeds that require a straight beak to eat, the other with seeds requiring a curved beak. As long as things go along normally, the population contains a mixture of the two beak types.

Visual #10-21

One day the volcano erupts. Its poisonous gases kill all the animals on the eastern half, as well as all the trees whose seeds require straight beaks. (In nature, some individuals have a greater tolerance for harmful substances than others.)

Visual #10-22

Months later the volcano settles down and becomes dormant again. The surviving birds from the west begin to fly to the eastern half again. Those with straight beaks find nothing to eat and either fly back or starve. Those with curved beaks (bb genes only) stay and begin to reproduce. Soon there are only curved-beak birds on the eastern half of the island. Since they have no B genes, they will never again produce straight-beak offspring.

Visual #10-23

Visual #10-24

Another disaster strikes. A great windstorm blows many of the birds from both halves of the island to an island too far away for them to fly back. All the trees on the new island have seeds that require straight beaks. The curved-beak birds starve, leaving a smaller and smaller percentage of b genes in the population. After many generations, almost all the b genes are eliminated. The few curved-beak birds that hatch on the island quickly die, leaving only straight-beak adults.

Visual #10-25

This is not evolution. The founder population originally had two beak variants due to different combinations of genes. After all the circumstances above, the group of birds as a whole still only has two beak variants due to difference combinations of genes. However, individuals in some locations have become specialized (adapted) to fit into their environment.

Visual #10-26

- The group of curved-beaks have lost the ability to produce straight-beak offspring.
- Since the group of straight-beaks lives in an area not suitable for curved-beaks, babies with that shape die quickly. The curved-beak genes likely become rarer and may disappear entirely.

The only thing that changed was the geographic distribution of the two varieties. Nothing new was added. Nothing evolved.

b. Irrelevance of Galapagos to evolution.

Visual #10-27

An analogy to show how the changing average beak size has nothing to do with evolution: Suppose a five foot tall dictator was sensitive about his height and de-

cided to kill everybody taller than himself. The average height in his country would immediately decrease. However, as soon as he died or was overthrown, tall children would no longer be eliminated and the average height would gradually return to its former level. Like the average beak size, this is not evolution. No new genes were added.

Changes in average beak size among the Galapagos finches are a good example of natural selection, not evolution. Natural selection can explain how they might have become specialized after they arrived, but it cannot explain how the founder population acquired all their genetic information in the first place. The specialized groups each have less information than their generalized ancestors. They are degenerate, not more advanced. Simple to complex evolution cannot explain how the ancestors got their genetic information in the first place.

Visual #10-28

Geographic distribution has to do with the diversification of a founder population into species, but it cannot explain the origin of the founder population.

c. Real world vs. hypothetical processes.

In the real world, there are seldom just two alleles controlling any given characteristic. However, the principle is the same. If a founder population starts to radiate outward from a starting point -- say, from the Atlantic Ocean toward the Pacific -- its members encounter varying food sources and environmental circumstances as they travel. The individuals whose characteristics are best suited for each area tend to thrive and leave more offspring there. Those less suited will likely go back, die, or continue to migrate. As they continue to spread out the process will repeat. Because of the gradual loss of genetic information in those that keep migrating, there will be a gradual shift in characteristics of the species from the starting to the ending points. The population will tend to become more and more specialized as it moves farther away from where it began. Some groups may even become reproductively isolated from the others. In this case, they are defined as new species even though they do not have any new features.

G. EXAMPLES OF ARTIFICIAL SELECTION - Selective Breeding.

Humans have been able to develop new strains of animals and plants by selectively breeding for desired features. For example, breeders have produced cows that give more milk, chickens that lay more eggs, dogs with fluffier hair, and so on.

Some genes (*homeotic*) in DNA produce crucial structures such as hearts, lungs, kidneys and so on. If these genes are not present, the animal will not live long. However, other genes control nonessential characteristics such as skin color, eye color, etc. These can occur in multiple variations known as alleles. Some alleles (e.g., brown eyes in humans) are dominant, i.e., expressed any time they are present. Others are recessive, i.e., expressed only when no dominant ones are present.

Breeders need not know exactly what genes are present to produce desired features. They breed individuals that have those features and eliminate the ones without them by isolating or killing them. After enough generations where only the desired features are preserved, they can conclude that the undesired genes have been bred out. Nothing new was added; undesired genes were eliminated.

Visual #10-29

As an example of the need for the genes to be present from the beginning, suppose monkeys decided to jump out of trees so they could acquire the ability to fly like the winged ones in the Wizard of Oz. They would never succeed because monkeys do not have any genes for wings. They would simply fall to their deaths generation after generation without ever developing the needed genes.

Visual #10-30

In an extremely simplified illustration of selective breeding, suppose a certain variety of rose had only two alleles for color, yellow (recessive) and red (dominant). If each plant had only two gene sites for color with an equal probability of each being occupied by the dominant or recessive allele, an average of one out of four offspring should be yellow. However, we could selectively breed the offspring to produce either all red or all yellow flowers within as few as two generations. Nothing would have evolved; we would merely have eliminated previously existing genes from the selectively bred strain.

1. ***FRUIT FLIES.***

   Selective breeding experiments on the fruit fly *Drosophila* show that the principle is not limited to a single gene as in this illustration. The flies have been separated into groups according to desired characteristics such as eye color, number of hairs on the thorax, etc. As each new generation matures, only those individuals with the desired features are allowed to breed. The researchers need not know exactly what genes produce the structures; they simply repeat the process for many generations until each group consists almost entirely of individuals that have the selected characteristics. If two groups that have been kept separated for a great many generations are finally allowed to mix together, they are sometimes unable to interbreed.

Visual #10-31

> Scientists have concluded that some genes affect more than one function, a phenomenon known as *pleiotropy*. In this case, the ability to breed seems to work alongside one of the selected characteristics mentioned above.

   In this case each of the groups is reproductively isolated from the others. Because of their inability to interbreed they are defined as separate species, but, no new genes were added. The desired features were accentuated by eliminating undesired genes.

2. ***WHEAT VARIETIES.***

Visual #10-32

   A number of the wheat varieties in use around the world have been traced back to a founder population in Turkey (Hirst, 2019). (Especially Triticale, the type of grain the Tribbles liked to eat in the Star Trek episode "The Trouble with Tribbles".) The farther away they are, the more specialized are the varieties that spread naturally, i.e., not transported by humans. This fits with the Biblical record of humanity restarting from the Mountains of Ararat in Turkey after the Flood (Gen. 8:4).

3. ***HYBRIDIZATION OF HORSES.***

Visual #10-33

   The crossbreeding of horses (*Equus caballus*) and donkeys (*Equus asinus*) helps to illustrate the concept of species by going in the opposite direction. Both belong to the genus *Equus*. They are frequently crossbred to produce a hybrid known as a mule, desirable because it has greater strength, stamina, intelligence, sure-footedness, and environmental tolerance than either of the parents. Horses and donkeys have different numbers of chromosomes. Most of the mules they produce are sterile, but a very small number have been fertile (e.g., the foal of a male donkey and a female mule – Jones & Johnsen, 1985). Thus, though they are considered different species within the same genus, horses and donkeys hint at what the limits of a single species might be.

4. ***UNINTENTIONAL SELECTIVE BREEDING OF TUSKLESS AFRICAN ELEPHANTS.*** (See Campbell-Staton et al., 2021)

   In the aforementioned experiments on fruit flies, the test subjects were deliberately selected for desired characteristics. A similar though unintentional situation happened to elephants at Gorongosa National Park in Mozambique, Africa in the late 1970s through early 1990s.

Visual #10-34

   Adult males were at great risk of being killed by ivory poachers because of their large tusks. Some of the females also had tusks and were at risk, though tuskless fe-

males were not in danger. The poachers had free rein because the military was involved in a civil war and was not able to protect elephants from them.

Elephants that possess tusks have them because their genes contain the instructions to produce them. Though the exact location of the gene for tusks has not been determined, it is believed to be somewhere on the X chromosome. The normally functioning version of this chromosome is described as X+. All males studied so far inherit one of these chromosomes from each parent, producing an arrangement of X+X+. However, a mutated version described as X- leads to abnormal tusk development before birth.

- Females who have the X+X+ arrangement have two tusks. Those with X+X- may have one or no tusks. Those with X-X- have no tusks. Regardless, they survive.
- Males automatically inherit a copy of X+ from their fathers. If they inherit it from the mother also, they will have normal tusk development. However, for some unknown reason males who inherit the X- chromosome from the mother die before birth. (This seems to be another example of pleiotropy as noted concerning fruit flies, where a single gene has more than one effect.)

As poachers seeking ivory killed the tusked elephants during a civil war in Mozambique, they gradually reduced the number of X+ chromosomes in the population. Some of the females that were not killed had the X-X- arrangement, rendering them unable to bear live male offspring. Even those with X+X- had a 50/50 chance of passing the X- variation on to the next generation, effectively wiping out all their male offspring.

As a result of the poaching, the percentage of tuskless females increased from 18.5% to 50.9% over the span of only 15 years (Campbell-Staton et al., 2021). Also, since males require the X+ chromosome from their mothers to survive until birth and since tuskless females do not have this chromosome, fewer males survived the gestation period.

Though some refer to this change as rapid evolution, it is actually artificial selection due to interference by poachers. Evolution requires the addition of new genes and features that were not previously present. Nothing new was added to the elephant population in Mozambique; instead they are on the verge of losing their tusks entirely.

IV. CHAPTER SUMMARY

1. Creationists and evolutionists do not use different sets of data. Each interprets the data according to their basic beliefs.
2. Creationists interpret the suites of fossils in rock strata as representing ecological communities; evolutionists interpret them as representing time periods.
3. Many published evolutionary reports seem to hint at the thoroughly falsified idea of Lamarckianism, that the gain or loss of features and structures by use and disuse of body parts could be passed on to future generations. Features and structures are actually the results of information contained in DNA, which is unaffected by use and disuse of physical structures.
4. Mutations can produce changes to future generations, but in each type that reproduces sexually a male and female living at the same time and same place would have to experience many identical mutations as well as complementary mutations in their reproductive systems.
5. *Species* and *Genus* are defined by reproductive characteristics. However, there is no way to perform breeding experiments on extinct animals or fossils. In many cases, classification is done according the the writer's best guess, which can be colored by biases.
6. The human population has increased from an estimated 1 billion to over 8 billion in just 128 years. If primates have really existed for over 55 million years it seems reasonable to

expect a far greater number of primate fossils than have actually been found.

7. If fossils are formed by random processes, it seems likely that the most recent types would have the best fossil record. They do not.
   - Creationists explain the fossil record of higher primates in terms of catastrophic fossilization: the most mobile and intelligent animals would have been able to escape burial the longest. And since they lived in ecological communities, they are buried in communities.
   - Evolutionists believe the fossil record is simply a matter of accidental burial.
8. Classification of unknown types of fossils is largely a matter of opinion. Some paleontologists are "lumpers" who tend to combine groups, while others are "splitters" who tend to separate them.
9. Individual differences between fossils can be significant. In several cases, new species and genus names have been assigned based on only a few teeth or other fragments.
10. Environmental factors do not affect DNA, but they can cause body parts of individuals to change. If only a few fragments are available, this can lead to the invention of new mistaken categories.
11. Some groups such as large roaring cats display a great deal of diversification but can nevertheless breed together, indicating that they belong to the same species.
12. Selective breeding (whether natural of artificial) can result in groups that are no longer able to interbreed. They are therefore defined as new species, but no genetic information has been gained. It has been lost. This fits much better with the idea of complex to simple (creation) then with simple to complex (evolution).