Chapter 4
What Are “Kinds” in Genesis?

by Bodie Hodge and Dr. Georgia Purdom on April 16, 2013; last featured October 1, 2013

Often, people are confused into thinking that a “species” is a “kind.” But this isn’t necessarily so.

“Zonkeys, Ligers, and Wholphins, Oh My!” Although not exactly the same mantra that the travelers in the classic *Wizard of Oz* repeat, these names represent real life animals just the same. In fact, two of these strange-sounding animals, a zonkey and a zorse, can now be seen at the new Creation Museum petting zoo. But what exactly are these animals and how did they come to be? Are they new species? Can the Bible explain such a thing?

What Is a “Kind”?

Figure 1. Zonkey and zorse at the Creation Museum

The first thing that needs to be addressed is: “What is a kind?” Often, people are confused into thinking that a “species” is a “kind.” But this isn’t necessarily so. A *species* is a man-made term used in the modern classification system. And frankly, the word *species* is difficult to define, whether one is a creationist or not! There is more on this word and its definition and relationship to “kinds” later in this chapter. The Bible uses the term “kind.” The Bible’s first use of this word (Hebrew: *min*) is found in Genesis 1when God creates plants and animals “according to their kinds.” It is used again in Genesis 6 and 8 when God instructs Noah to take two of every kind of land-dwelling, air-breathing animal onto the ark and also in God’s command for the animals to reproduce after the Flood. A plain reading of the text infers that plants and animals were created to reproduce within the boundaries of their kind. Evidence to support this concept is clearly seen (or rather not seen) in our world today, as there are no reports of dats (dog + cat) or hows (horse + cow)! So a good rule of thumb is that if two things can breed together, then they are of the same created kind. It is a bit more complicated than this, but for the time being, this is a quick measure of a “kind.”

As an example, dogs can easily breed with one another, whether wolves, dingoes, coyotes, or domestic dogs. When dogs breed together, you get dogs; so there is a dog kind. It works the same with chickens. There are several breeds of chickens, but chickens breed with each other and you still get chickens. So there is a chicken kind. The concept is fairly easy to understand.

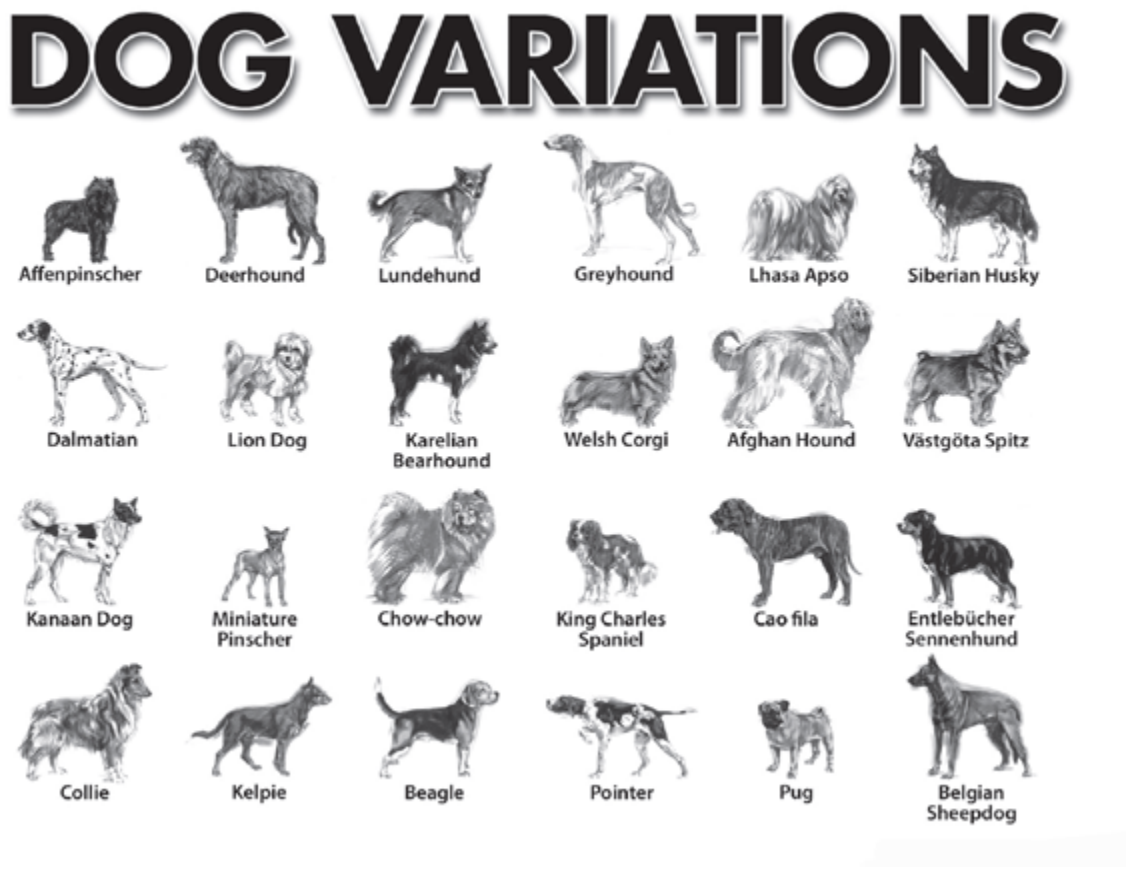


Figure 2. Domestic dogs all belong to the same dog kind.

But in today's culture, where evolution and millions of years are taught as fact, many people have been led to believe that animals and plants (that are classed as a specific "species") have been like this for tens of thousands of years and perhaps millions of years. So when they see things like lions or zebras, they think they have been like this for an extremely long time.

From a biblical perspective, though, land animals like wolves, zebras, sheep, lions, and so on have at least two ancestors that lived on Noah's ark, only about 4,300 years ago. These animals have undergone many changes since that time. But dogs are still part of the dog kind, cats are still part of the cat kind, and so on. God placed variety within the original kinds, and other variation has occurred since the Fall due to genetic alterations.

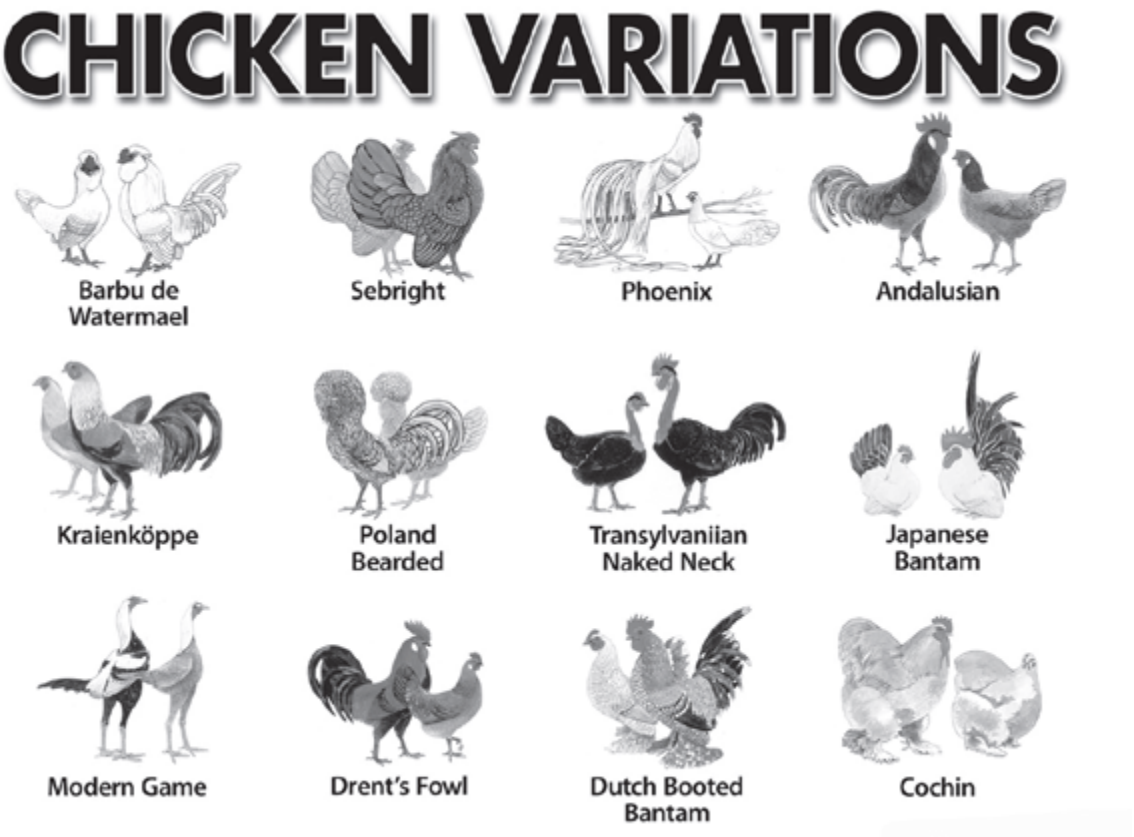


Figure 3. The amazing variety of chicken breeds all belong to the same kind.

Variety within a "Kind"

Creation scientists use the word baramin to refer to created kinds (Hebrew: *bara* = created, *min* = kind). Because none of the original ancestors survive today, creationists have been trying to figure out what descendants belong to each baramin in their varied forms. Baramin is commonly believed to be at the level of family and possibly order for some plants/animals (according to the common classification scheme of kingdom, phylum, class, order, family, genus, species). On rare occasions, a kind may be equivalent to the genus or species levels.

Baraminology is a field of study that attempts to classify fossil and living organisms into baramins. This is done based on many criteria, such as physical characteristics and DNA sequences. For living organisms, hybridization is a key criterion. If two animals can produce a hybrid, then they are considered to be of the same kind.[1]However, the inability to produce offspring does not necessarily rule out that the animals are of the same kind, since this may be the result of mutations (since the Fall).

Zonkeys (from a male zebra bred with a female donkey), zorses (male zebra and female horse), and hebras (male horse and female zebra) are all examples of hybrid animals. Hybrid animals are the result of the mating of two animals of the same "kind." Perhaps one of the most popular hybrids of the past has been the mule, the mating of a horse and donkey. So seeing something like a zorse or zonkey shouldn't really surprise anyone, since donkeys, zebras, and horses all belong to the horse kind.

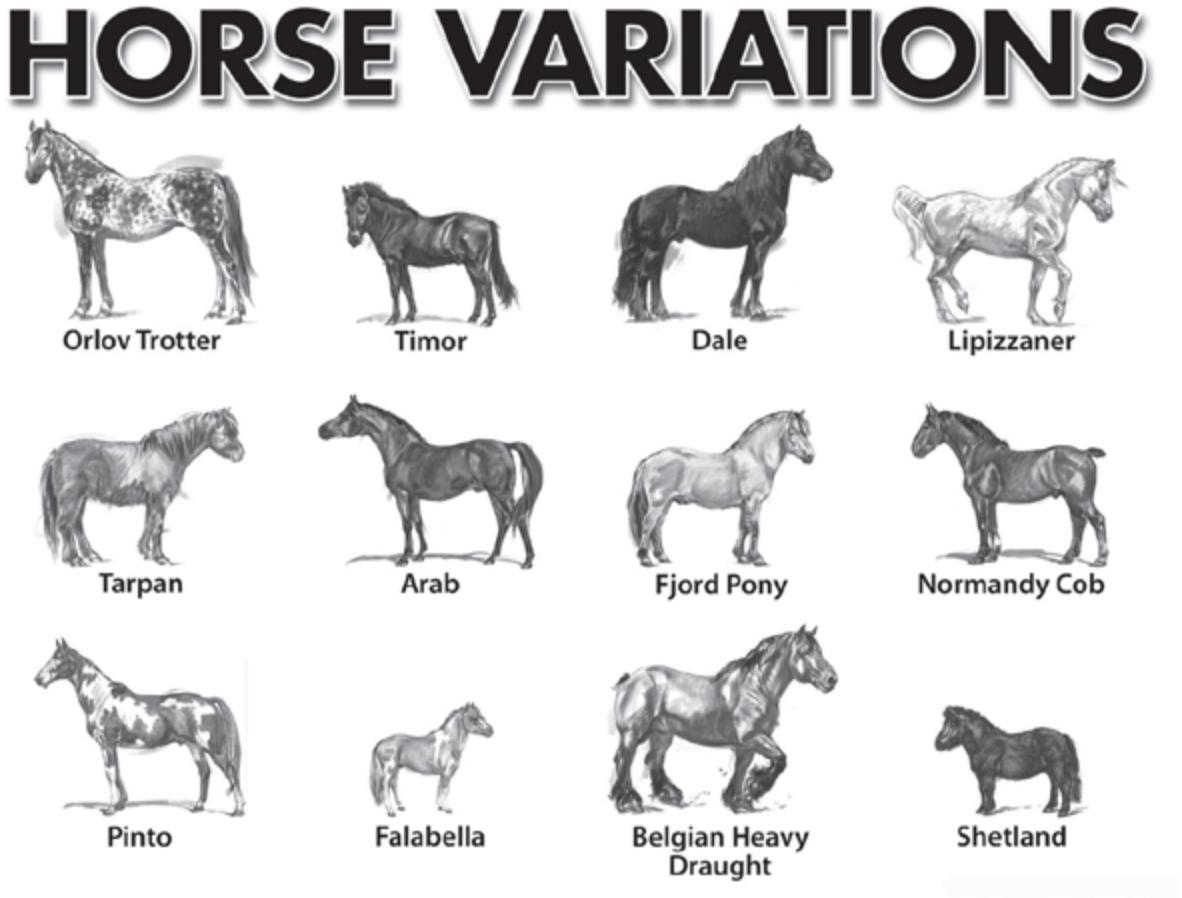


Figure 4. Horses of all shapes and sizes are of the same kind.

The concept of kind is important for understanding how Noah fit all the animals on the ark. If kind is at the level of family/order, there would have been plenty of room on the ark to take two of every kind and seven of some. For example, even though many different dinosaurs have been identified, creation scientists think there are only about 50 "kinds" of dinosaurs. Even though breeding studies are impossible with dinosaurs, by studying fossils one can ascertain that there was likely one Ceratopsian kind with variation in that kind and so on.

After the Flood, the animals were told to "be fruitful and multiply on the earth" (*Genesis 8:17*). As they did this, natural selection, mutation, and other mechanisms allowed speciation within the kinds to occur. Speciation was necessary for the animals to survive in a very different post-Flood world. This is especially well illustrated in the dog kind in which current members (e.g., coyotes, dingoes, and domestic dogs) are confirmed to be descended from an ancestral type of wolf.[2]

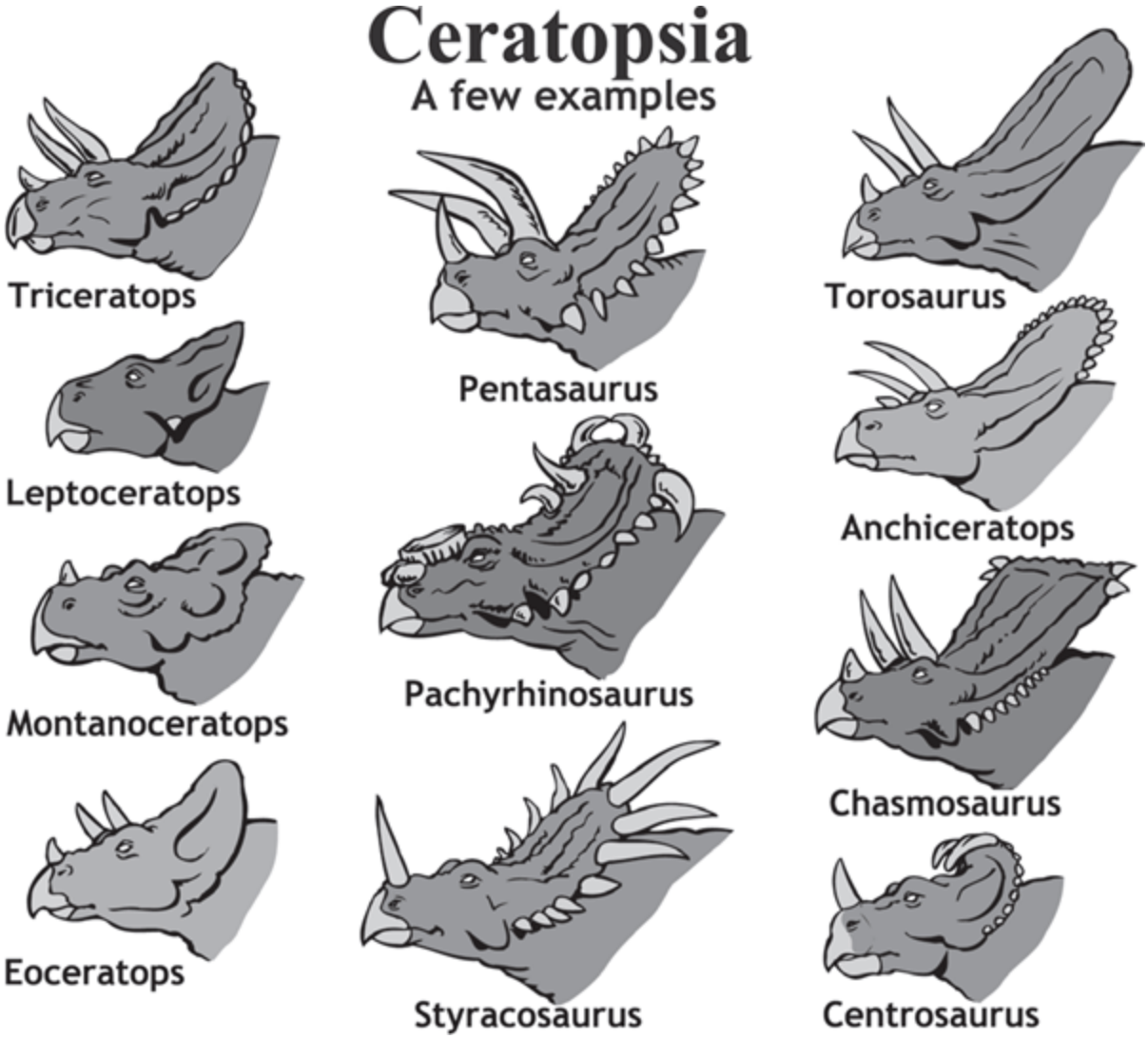


Figure 5. Using fossil evidence, we can identify kinds within the dinosaurs.

Hybrid animals are usually the result of parent animals that have similar chromosome numbers. Many times the hybrids are infertile due to an uneven chromosome number that affects the production of eggs and sperm. However, this is not always the case, as even some mules (horse + donkey) have been known to reproduce. Consider some of the following amazing animal hybrids.

Zonkeys, Zorses, and Mules

These hybrids are the result of mating within the family Equidae. As we've said before, zonkeys are the result of mating a male zebra and a female donkey; zorses are the result of mating a male zebra and a female horse; and mules are the result of mating a male donkey and a female horse. But reverse matings (such as hinnies produced from a male horse and female donkey) are rare, although still possible. All are considered "infertile" due to uneven chromosome numbers, but fertility has been observed in some cases. Zonkeys and zorses have a mixture of their parents' traits, including the beautiful striping patterns of the zebra parents.

Ligers, Tigons, and Other Cats

These hybrids are the result of mating within the family Felidae. Ligers are the result of mating a male lion and a female tiger. Ligers are the largest cats in the world, weighing in at over 1,000 pounds (450 kg). Tigons are the result of mating a female lion and a male tiger. These matings only occur in captivity, since lions live in

Africa, tigers live in Asia, and the two are enemies in the wild. Female hybrids are typically fertile while male hybrids are not.

Other hybrids in this family include bobcats that mate with domestic cats and bobcats with lynx (Blynx and Lynxcat). There have been mixes of the cougar and the ocelot, as well as many others. This shows that large, midsize, and small cats can ultimately interbreed, and therefore suggests that there is only one cat kind.

Wolphin

Turning to the ocean, this hybrid is the result of mating within the family Delphinidae. The wholphin is the result of mating a false killer whale (genus *Pseudorca*) and bottlenose dolphin (genus *Tursiops*). Such a mating occurred in captivity at Hawaii's Sea Life Park in 1985.[3] The wholphin is fertile. This hybrid shows the difficulty of determining the species designation, since a major criterion is the ability to interbreed and produce fertile offspring. Even though the whale and dolphin are considered separate genera, they may, in fact, belong to the same species. This shows how difficult it is to define the term species. Of course, from a biblical perspective it is easy to say they are both the same kind!

"Fixity of Species" and Changing Definitions

So what is the relationship between the *kinds* and *species* anyway? If one were to ask around to see what kind of definitions people have of the word *species* [or *genus*], most would respond by saying they have something to do with classification. In today's society, the words *genus* and *species* are synonymous with the Linnaean taxonomy system.

In the early 1700s, if someone said something about a "species" or "genus," it would have had nothing to do with classification systems. So why is this important today and what can we learn from it? The word *species*, and its changing definition, were partly responsible for the compromise of the Church in late 1800s. In fact, the Church is still struggling over this change. Let's do a brief history review.

Species: Origin and Meaning

The English word *species* comes directly from Latin. For example, the Latin Vulgate (early Latin Bible translation), by Jerome around A.D. 400, says of *Genesis 1:21*:

creavitque Deus cete grandia et omnem animam viventem atque motabilem quam produxerant aquae in species suas et omne volatile secundum genus suum et vidit Deus quod esset bonum [emphasis added].

Species is also found in the Latin version in *Genesis 1:24, 25* as well. The Latin basically meant the biblical "kind." In fact, this word carried over into English (and other languages that have some Latin influence). It means a "kind, form, or sort." Another word that was commonly used for a kind in the Latin Vulgate was *genus*. This is evident in *Genesis 1:11, 12, and 21*. In both cases, these two words (*species* and *genus*) were used for the Hebrew word *min* or kind.

It made sense that Carl Linnaeus, a Swedish Christian, began using Latin terms for his new classification system. It was logical to use these common terms, which were a part of the commercial language throughout Europe (much in the way that English, for example, is seen as a universal language in the world today for communication and so on). Linnaeus even wrote his large treatise, *Systema Natvrae*, and other findings, in Latin in the mid to late 1700s.

Early commentators recognized that species originally meant the biblical kinds, as even John Calvin, prominent reformer in the 1500s, stated in his notes on *Genesis 1:24*:

> I say, moreover, it is sufficient for the purpose of signifying the same thing, (1) that Moses declares animals were created "according to their species": for this distribution carried with it something stable. It may even hence be inferred that the offspring of animals was included. For to what purpose do distinct species exist, unless that individuals, by their several kinds, may be multiplied?

Of course, Calvin originally wrote in Latin, but this early English translation by Thomas Tymme in 1578 still shows the point that the word *species* was used to mean the biblical kind. Calvin is even pointing out stability or fixity (i.e., biblical kinds). Dr. John Gill, about the same time as Linnaeus, equates species and kinds in his note under *Genesis 1:22* by saying:

> With a power to procreate their kind, and continue their species, as it is interpreted in the next clause; *saying, be fruitful, and multiply, and fill the waters in the seas*.

Others, such as Basil, prior to the Latin Vulgate, discussed species as the biblical kind in the fourth century in his *Homilies* on *Genesis 1*. Matthew Henry, in the late 1600s and early 1700s, used species as kinds in his notes on *Genesis 2:3*, saying there would be no new "species" created after creation week had completed. The list could continue. The point is that *species* originally meant the biblical kind.

Species: A Change

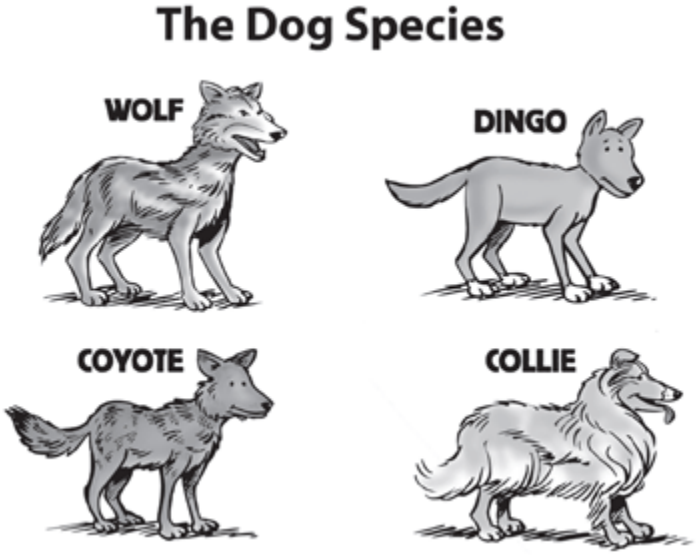


Figure 6. Original definition of species: all dogs were one species.

After Linnaeus, both of these words (*species* and *genus*) were commonly used in modern biological classification systems with slightly different definitions. In the mid-to-late 1700s, *species*began taking on a new, more specific definition in scientific circles as a biological term (that definition is still being debated even today). But, by and large, the definition had changed so that, instead of there being a dog *species* (or dog kind), there were many dog *species*.

In the common and Church sense, the word *species* was still viewed as the biblical "kind." But as the scientific term gained popularity, this led to a problem. When theologians and members of the Church said "fixity of species" (meaning fixity of the biblical kinds) people readily saw that there were variations among the *species* (by the new definition). They thought, *But* species *do change*! Of course, no one ever showed something like a dog changing into something like a cat. Dogs were still dogs, cats were still cats, and so on.

However, a bait-and-switch fallacy had taken place. Christians were teaching fixity of species (kinds), but the definition of *species* changed out from under them. So Christians looked ignorant when people began observing that species—by the *new* definition—do change. Of course, in reality, this was merely variation within the created kinds. For example, dogs could be observed changing into something different—still dogs, but not looking like other "species" (by the new definition) of dogs. So it *appeared* that the created kinds were becoming new species (new definition), even though the animals did not change into a different kind of animal. It appeared that the Church was wrong.

Perhaps the most influential critique of fixity of species came from Charles Darwin, whose book *On the Origin of Species* tackled the misunderstood idea of *fixity of species* (though it never used the term "fixity"). Mr. Darwin studied many creatures during his travels and realized there was variation and not *fixity of species* (by the new definition).

The Implications

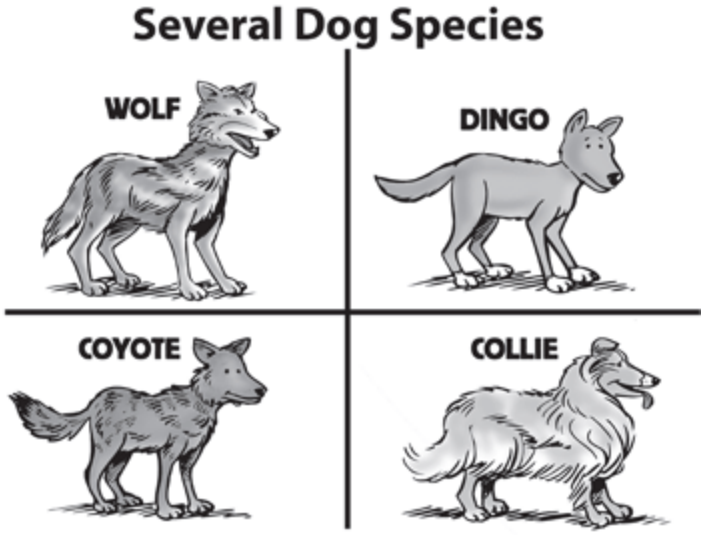


Figure 7. New definition of species: several wolf species, several coyote species, etc.

The results of this were devastating to the Church. And people began doubting the Word of God as a result, walking away from Christianity, and embracing an evolutionary philosophy. George Bentham, writing May 30, 1882, to Francis Darwin regarding his father Charles's ideas, said:

> I have been throughout one of his most sincere admirers, and fully adopted his theories and conclusions, notwithstanding the severe pain and disappointment they at first occasioned me. On the day that his celebrated paper was read at the Linnean Society, July 1st, 1858, a long paper of mine had been set down for reading, in which, in commenting on the British Flora, I had collected a number of observations and facts illustrating what I then believed to be a fixity in species, however difficult it might be to assign their limits, and showing a tendency of abnormal forms produced by cultivation or otherwise, to withdraw within those original limits when left to themselves. Most fortunately my paper had to give way to Mr. Darwin's and when once that was read, I felt bound to defer mine for reconsideration; I began to entertain doubts on the subject, and on the appearance of the 'Origin of Species,' I was forced, however reluctantly, to give up my long-cherished convictions, the results of much labour and study, and I cancelled all that part of my paper which urged original fixity, and published only portions of the remainder in another form, chiefly in the 'Natural History Review.'[4]

Even today, an objection commonly leveled at the Bible is that it claims that species are fixed. A good response would be: "To which definition of species are you referring?" By the old definition (as a kind), creationists would agree, but would probably better state it in modern English as fixity of the created kinds so as not to confuse the issue. The idea of one kind changing into another can be argued against based on the fact that no such change has ever been observed.

After Darwin's book, many churches gave up *fixity of species* (by either definition) and began taking compromised positions such as theistic evolution (basically giving up Genesis for molecules-to-manevolution and then picking up with Abraham). Realizing that the Church had been duped by a bait-and-switch fallacy provides a valuable learning tool. When people fail to understand history, they often repeat it.

A Great Place for Creation Research

All of these animals' ancestors that we have discussed above—horses, donkey, zebras, tigers, lions, whales, and dolphins—were created with genetic diversity within their various kinds (or by the older definition of species). Through time, the processes of natural selection, mutation, and other mechanisms have altered that original information (decreased or degenerated) to give us even more variation within a kind.

Great variety can be observed in the offspring of animals of the same kind, just as the same cake recipe can be used to make many different cakes with various flavors and colors. Hybrids have a portion of the same genetic information as their parents but combined in a unique way to give a very unique-looking animal. What an amazing diversity of life God has created for us to enjoy!

The study of created kinds is an exciting area of research, and our hope is to help encourage others to get involved. Whether studying the duck-goose kind, elephant-mammoth kind, camel-llama kind, apple-pear kind, or others, the field of baraminology is a great place for biologists, botanists, geneticists, and paleontologists (for extinct kinds) to get immersed in creation research.

Footnotes

1. Some might argue that if the hybrid offspring are infertile, then this indicates that the parent animals are of separate created kinds. However, fertility of the offspring has no bearing on the kind designation. Hybridization is the key.
2. Savolainen et al., "Genetic Evidence for an East Asian origin of Domestic Dogs," *Science* 298 (2002): 1610–1613.
3. Stephen Adams, "Dolphin and Whale Mate to Create a 'Wholphin,' " Telegraph.co.uk website news, April 2, 2008, Telegraph Media Group Limited, www.telegraph.co.uk/news/uknews/1582973/Dolphin-and-whale-mate-to-create-a-wolphin.html.
4. Francis Darwin, ed., *The Life and Letters of Charles Darwin Including an Autobiographical Chapter*, Volume 2, as produced by Classic Literature Library, Free Public Book Domain, originally published in 1897, www.charles-darwin.classic-literature.co.uk/the-life-and-letters-of-charles-darwin-volume-ii/ebook-page-41.asp

Chapter 5
How Could Noah Fit the Animals on the Ark and Care for Them?

by John Woodmorappe on October 15, 2013; last featured March 2, 2014

While it is possible that God made miraculous provisions for the daily care of these animals, it is not necessary—or required by Scripture—to appeal to miracles.

[Editor's Note (July 2016): See the latest research by AiG's Ark Encounter researchers on Ark animals, size, logistics, and other details at ArkEncounter.com.]

According to Scripture, Noah's ark was a safe haven for representatives of all the kinds of air-breathing land animals and birds that God created. While it is possible that God made miraculous provisions for the daily care of these animals, it is not necessary—or required by Scripture—to appeal to miracles. Exploring natural solutions for day-to-day operations does not discount God's role: the biblical account hints at plenty of miracles as written, such as God bringing the animals to the ark (*Genesis 6:20; 7:9, 15*), closing the door of the ark (*Genesis 7:16*), and causing the fountains of the deep and the windows of heaven to open on the same day (*Genesis 7:11*). It turns out that a study of existing, low-tech animal care methods answers trivial objections to the ark. In fact, many solutions to seemingly insurmountable problems are rather straightforward.[1]

How Did Noah Fit All the Animals on the Ark?

WAS EVERY SPECIES ON THE ARK? NO!

To answer this question, we must first ask how many animals were actually on the ark. Critics have fantasized the presence of millions of animals overloading the ark. In actuality, the Bible makes it clear that the cargo was limited to land-dwelling, air-breathing vertebrate animals—corresponding to modern birds, mammals, and reptiles, as well as their extinct counterparts.

Was every species on the ark? No! From chapters such as *Leviticus 11*, it is obvious that the created kind (*min* in Hebrew, in *Genesis 1:11–12, 21, 24–25*) was a much broader category than the modern term of classification, species. Current baraminological[2] research suggests that the created kind most closely corresponded to the *family* level in current taxonomy. However, to be conservative in this study, the genus was set as equivalent to the original created kind. As for the clean animals that entered the ark in seven pairs, this added a modest number of additional animals, notably bovids (cow-like mammals) and cervids (deer-like mammals). Under these conservative assumptions, there were no more than 16,000 land animals and birds on the ark.

According to the Bible, the ark had three decks (floors). It is not difficult to show that there was plenty of room for 16,000 animals, assuming they required approximately the same floor space as animals in typical farm enclosures and laboratories today. The vast majority of the creatures (birds, reptiles, and mammals) are small. The largest animals were probably only a few hundred pounds of body weight.

It is still necessary to take account of the floor spaces required by large animals, such as elephants, giraffes, rhinos, and some dinosaurs. But even these, collectively, do not require a large area. God would likely have sent to Noah young (and therefore small, but not newborn) representatives of these kinds so that they would have a full reproductive potential for life after the Flood to repopulate the earth (*Genesis 7:1–3*). Even the largest dinosaurs were relatively small when only a few years old.

Without tiering of cages, only 47 percent of the ark floor would have been necessary. What's more, many could have been housed in groups, which would have further reduced the required space.

What about the provisions for the animals? It can be shown that the food would have filled only 6 to 12 percent of the volume of the ark, and the potable water only an additional 9 percent of the same.[3]

What About the Dinosaurs?

There are only several hundred genera of dinosaurs known. What's more, the continuous invalidation of old names largely offsets the continuous discovery of new kinds of dinosaur genera.[4] Only a modest fraction of all dinosaurs reached giant size. About 16 percent of dinosaur genera had an adult weight in excess of ten tons, and almost half of dinosaur genera weighed no more than a ton when mature.

However, the foregoing is academic because dinosaurs could have been represented as young. Interestingly, according to the most recent models of dinosaur maturation, even the largest sauropod dinosaurs were no more than several hundred kilograms in weight by the time they were just over a year old,[5] which could have corresponded to their time of release from the ark.

What Did the Dinosaurs Eat?

Dinosaurs could have eaten basically the same foods as the other animals. The young representatives of the large sauropods could have eaten compressed hay, other dried plant material, seeds and grains, and the like. Carnivorous dinosaurs—if any were meat-eaters before the Flood—could have eaten dried meat, reconstituted dried meat, or slaughtered animals. Giant tortoises would have been ideal to use as food in this regard. They were large and needed little food to be maintained themselves. There are also exotic sources of meat, such as fish that wrap themselves in dry cocoons.

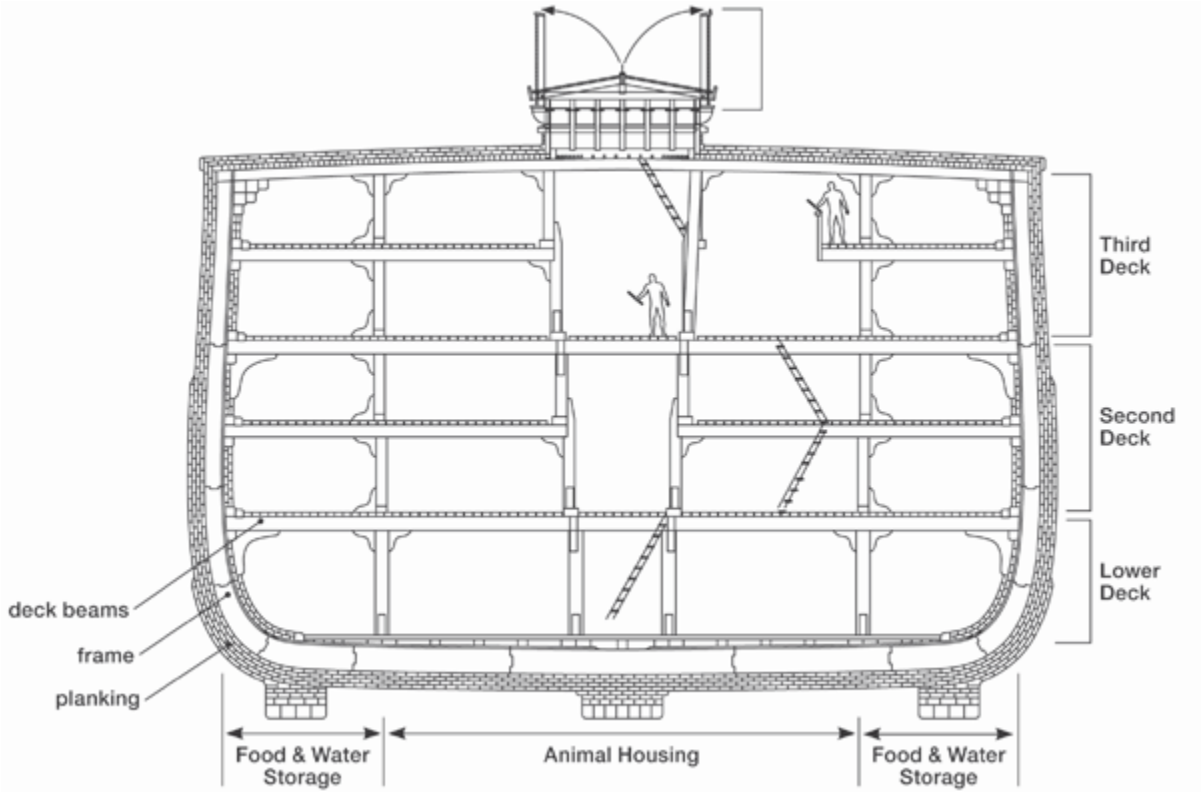


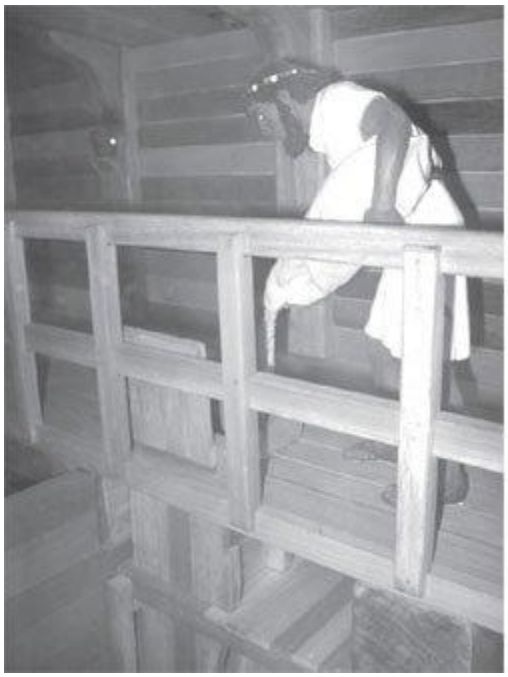
Figure 1. This is a cross-section view of a possible design of the interior of the ark. The proposed skylight roof could be opened. This might be the covering when "Noah removed the covering of the ark" (*Genesis 8:13*).

How Were the Animals Cared For?

Anti-Bible critics have compared the challenges of caring for the animals with that of modern zoos. This is fallacious. We must distinguish between the long-term care required for animals kept in zoos and the temporary, emergency care required on the ark. The animals' comfort and healthy appearance were not essential for emergency survival during one stressful year, where survival was the primary goal.

Studies of non-mechanized animal care indicate that eight people could have fed and watered 16,000 creatures. The key is to avoid unnecessary walking around. As the old adage says, "Don't work harder, work smarter."

Therefore, Noah probably stored the food and water near each animal. Even better, drinking water could have been piped into troughs, just as the Chinese have used bamboo pipes for this purpose for thousands of years. The use of some sort of self-feeders, as is commonly done for birds, would have been relatively easy and probably essential. Animals that required special care or diets were uncommon and should not have needed an inordinate amount of time from the handlers. Even animals with the most specialized diets in nature could have been switched to readily sustainable substitute diets. Of course, this assumes that animals with specialized diets today were likewise specialized at the time of the Flood. But that may not have been the case in the ancestral kinds that were taken on the ark.



Figures 2 and 3. With Noah being over 500 years in age, it would make sense that he had the knowledge to be able to incorporate automatic feeding and watering systems where they only had to be refilled occasionally.

Animals with Special Diets

Many challenges to the reliability of the biblical account of Noah's ark, based on animals' feeding requirements, are steeped in mythology. Do captive anteaters necessarily require ants? No! Neither do most insect-eating animals require insects in their diet. Nor do most animals that eat only live prey in nature necessarily require moving prey in captivity. (For the few that do, it would not have been difficult to provide a rudimentary live-animal feeder.)

Even the most "fussy" animal kinds today contain individual representatives that can depart from the foods their kind normally eats in nature. For example, although most koalas eat nothing but fresh eucalyptus leaves,

there are individual koalas that will subsist on dried eucalyptus leaves. Likewise, some individual pandas will accept dried bamboo stalks.

How Did the Animals Breathe?

The ventilation of the ark was not only necessary to provide fresh air but, more important, to dissipate body heat. A basic, non-mechanical ventilation system was sufficient for the ark. The density of animals on the ark, compared to the volume of enclosed space, was much less than we find in some modern, mass animal housing used to keep stock that are raised for food (such as chicken farms), which often require no special mechanical ventilation.

The Bible is not specific as to the kind and size of window on the ark. It is reasonable to believe that one relatively small window would have adequately ventilated the ark. Of course, if there were a window running along the top center section, which the biblical description allows, all occupants would be even more comfortable. It is also interesting to note that the convective movement of air, driven by temperature differences between the warm-blooded animals and the cold interior surfaces, would have been significant enough to drive the flow of air. Plus, wind blowing into the window would have enhanced the ventilation further. However, if supplementary ventilation was necessary, it could have been provided by wave motion or even a small number of animals harnessed to slow-moving rotary fans.

What Did Noah and His Family Do with the Animal Waste?

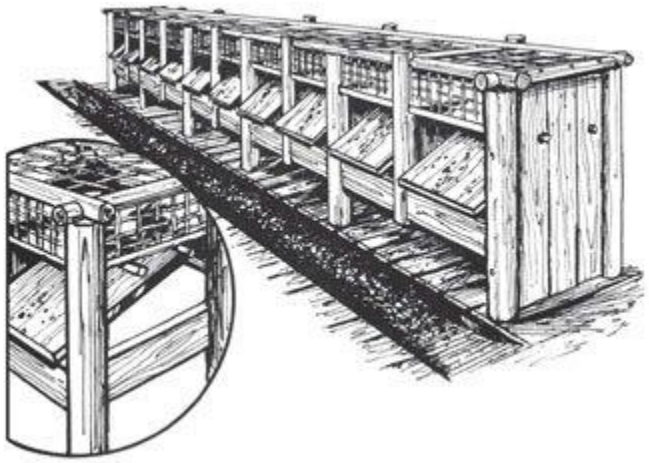


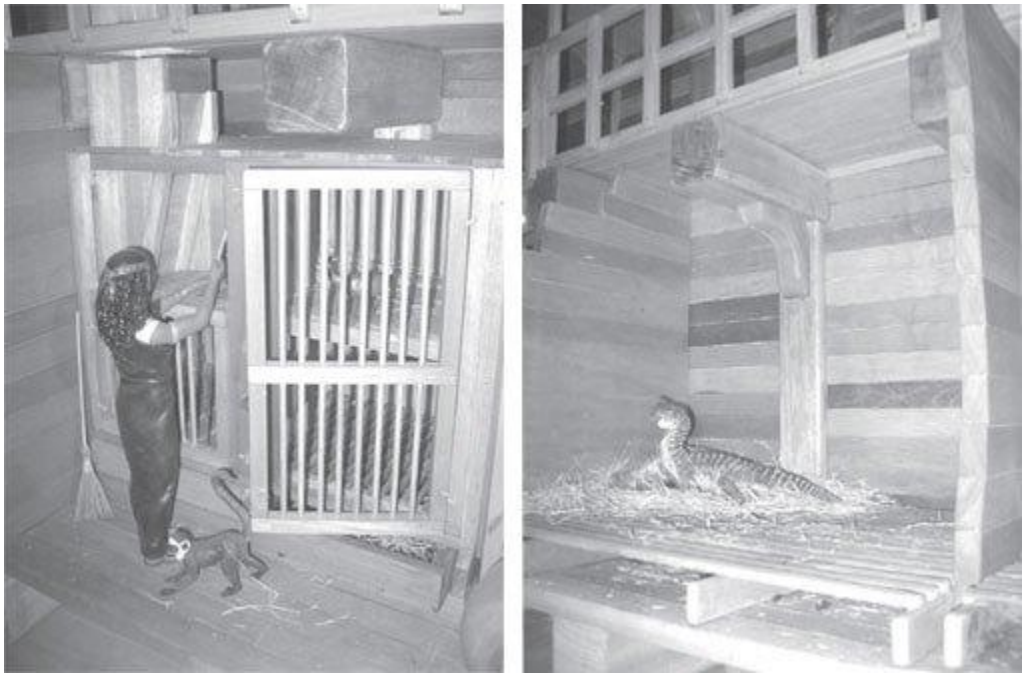
Figure 4. Animal enclosures with sloped, self-cleaning floors, emptying into a manure gutter or pit.
As much as 12 U.S. tons (11 m. tons) of animal waste may have been produced daily. The key to keeping the enclosures clean was to avoid the need for Noah and his family to do the work. The right systems could also prevent the need to change animal bedding. Noah could have accomplished this in several ways. One possibility would be to allow the waste to accumulate below the animals, much as we see in rustic henhouses. In this regard, there could have been slatted floors, and animals could have trampled their waste into the pits below. Small animals, such as birds, could have multiple levels in their enclosures, and waste could have simply accumulated at the bottom of each.

The danger of toxic or explosive manure gases, such as methane, would be alleviated by the constant movement of the ark, which would have allowed manure gases to be constantly released. Second, methane, which is half the density of air, would quickly find its way out of the window of the ark. There is no reason to believe that the levels of these gases within the ark would have remotely approached hazardous levels.

Alternatively, sloped floors in animal enclosures would have allowed the waste to flow into large central gutters and then into collection pits, allowing gravity to do most of the work. Noah's family could have then dumped this overboard without an excessive expenditure of manpower.

The problem of manure odor may, at first thought, seem insurmountable. But we must remember that throughout most of human history, humans lived together with their farm animals. Barns, separate from human living quarters, are a relatively recent development.

While the voyage of the ark may not have been comfortable or easy, it was certainly doable, even under such unprecedented circumstances.



Figures 5 and 6. Some floors could allow waste to fall below and could be stocked with hay or sawdust to soak it up. It is possible that a clean-up would not even be required for the duration of the year-long Flood.

Did the Animals Hibernate?

If animals hibernated, this would, of course, have greatly alleviated the need to feed, water, and remove the waste of the ark animals. Critics point out that the vast majority of animals on the ark were not of the type that hibernate. However, this ignores the possibility that hibernation (or its equivalent in tropical environments, such as aestivation) may have been much more widespread in the animal kingdom than it is today.

It is, of course, also possible that God put the animals into a sleep for most of the time that they were on the ark. But all this is moot. Whether supernatural or natural, hibernation was not necessary for the animals to have been adequately cared for on the ark. It only would have made it easier.

Were Single Pairs Sufficient?

Critics point to the fact that, when a single pair of animals is released, it usually does not lead to a lasting population. But this ignores the fact that, under modern conditions, the released pair must compete against pre-existing animals, causing it to usually lose out. In contrast, the ark-released animals were introduced to an environment free of competitors. Experience has shown that single-pair introductions usually do lead to

lasting populations when there are few or no competitors. One must also keep in mind that nowhere in the Bible does it claim that all animals that were released from the ark gave rise to lasting populations. There have been and continue to be extinctions, often caused by man.

Critics have also argued that single pairs are not sufficient to be able to transmit the genetic variability of the parent, pre-Flood population. This is a half-truth. In most traits, a single pair contains the most-commonly occurring gene forms (that is, alleles) that occur in the population at large. The rare alleles, which a single pair will seldom have, are usually uncommon in the population and of little or no relevance to its survivorship or fitness. Mutations in the post-Flood world could have created a new set of rarely occurring alleles.

Consider, for example, the human blood types. The relevant possibilities are: A-only, B-only, both A and B (that is, blood type AB), and neither A nor B (that is, blood type O). There are also rare blood types, but these, again, are just that—rare, and of little relevance to human survival. They are one-step mutational derivatives of the common blood types. A single pair of individuals would very likely have the A and B alleles represented within it. Rare blood types would be re-established by mutations of the common alleles after the Flood, and would probably not be the same as their pre-Flood counterparts.

Didn't the Ark-released Animals Eat Each Other?

Those who attack the Bible say that the carnivores released from the ark would have soon eaten up the herbivores, leading to the eventual extinction of both. This falsely assumes that the only sources of meat available to the ark-released carnivores were the ark-released herbivores. Such was not the case.

The post-Flood world must have had plenty of rotting corpses of various animals that were not buried in the Flood sediments. Experience has shown that most carnivores prefer to eat carrion than to kill live animals for food. Also, the Flood must have left behind many residual pools of water and marine life. As these waters retreated or dried up, fish and other marine animals were stranded in lakes, ponds, and streams on land. This could also have served as food for the ark-released carnivores. In fact, experience shows that many normally non–fish-eating carnivores, such as lions, will eat fish if it is available, and do so in preference to hunting their usual prey.

These alternative sources of food must have diverted the attention of predators for a considerable period of time after the Flood. This would have allowed the prey populations to build up to an appreciable size before they became the main target of the predators.

How Did Marine Life Survive?

What about the animals that were not on the ark? Critics have said that the Flood must have been so destructive that nothing could possibly have survived. How could they possibly know this? As a matter of fact, fish and other marine life produce an astonishing number of larval offspring. Only a tiny number of these need to survive in order to propagate their kind. And while much of the Flood waters may have been violent, many lateral and vertical parts of the water column would have allowed sea life to survive during the Flood.

How Could Freshwater and Saltwater Fish Coexist in the Flood?

Most saltwater fish cannot live in freshwater, and most freshwater fish cannot live in saltwater. So how could both have survived the Flood? To begin with, the intolerances are not symmetrical in nature. Most ocean fish can survive considerable reductions in the salinity of water, even though they cannot go all the way to the near-zero salinity of fresh water. In contrast, most freshwater life is intolerant of more than a slight elevation of salt levels in the water.

There is a range of brackish water (about 5–10 percent the salinity of current ocean water) that would be tolerated by nearly all ocean fish as well as a significant fraction of freshwater fish. What about those organisms that cannot tolerate this? Variations in salinity according to geographic area, and the probable stratification of denser, saltier water, would have created pockets of considerable salinity and other pockets that approached freshwater qualities. Sensitive organisms could survive there.

Finally, it should be noted that organisms that are extremely intolerant of either salinity or reductions in salinity vary from species to species. The narrow range that they tolerate probably arose since the Flood by the mechanisms of natural selection of some of the great genetic variability built into the original created kinds (and still observable today) and in some cases through mutations also. In fact, there is evidence from selective breeding that tolerance or intolerance to salinity can be markedly changed in a matter of generations.

Footnotes

1. For an in-depth, documented discussion of this and related topics in language that is understandable to lay people and students, see John Woodmorappe, *Noah's Ark: A Feasibility Study* (Dallas, TX: Institute for Creation Research, 2009).
2. Baramin is a term coined by creation scientists to describe the original created kinds. It comes from the Hebrew words *bara* (meaning "create") and *min* (meaning "kind").
3. Woodmorappe, *Noah's Ark: A Feasibility Study*, p. 17–21, 95–98.
4. M.J. Benton, "How to Find a Dinosaur, and the Role of Synonymy in Biodiversity Studies," *Paleobiology* 34 no. 4 (2008): 516–533.
5. T.M. Lehman and H.N. Woodward, "Modeling Growth Rates for Sauropod Dinosaurs," *Paleobiology* 34 no. 4 (2008): 264–281.

Chapter 6
Was the Flood of Noah Global or Local in Extent?

by Dr. Andrew A. Snelling and Ken Ham on April 17, 2013; last featured November 12, 2013

This is ultimately about the authority of God's Word, which plainly teaches that the Flood of Noah was global in extent.

Many Christians and their leaders believe that it is not relevant whether the Flood of Noah described in *Genesis 6–8* was global or localized (in the Mesopotamian Valley of the Tigris and Euphrates Rivers). After all, they say, it's not relevant to a Christian's salvation, and the gospel message to be preached is all about Jesus.

Besides, matters about rocks and the earth's history are the domain of the geologists, because the Bible isn't a science textbook. So if the geologists say there never was a global Flood, then that settles it! Thus, Christians who advocate an old earth agree with the secular geologists, and therefore they oppose any notion that the Flood of Noah was global.

However, whether the Flood of Noah was global or local in extent is a crucial question. This is because ultimately what is at stake is the authority of all of God's Word. Indeed, if the text of Scripture in Genesis 6–

8 clearly teaches that the Flood was global and we reject that teaching, then we undermine the reliability and authority of other parts of Scripture, including *John 3:16*. God's Word must be trustworthy and authoritative in all that it affirms.

Millions of Years or a Global Flood?

Secular geologists have interpreted the fossil-bearing sedimentary layers, such as those exposed in the walls of the Grand Canyon, as having taken millions of years to form. Countless sea creatures lived on shallow seafloors, for example, and were slowly buried, to be replaced by new sea creatures growing on the seafloors. The various sedimentary rock layers that we now see stacked up on top of one another thus supposedly slowly accumulated as sea creatures were progressively buried.

The guiding principle used by secular geologists to interpret the rock record is "the present is the key to the past," which means that the geologic processes we see operating today, at the rates they operate today, are all that are necessary to explain the rock layers (Figure 1). While catastrophes such as local flooding and volcanic eruptions are allowable because they do occur today, any suggestion of a global catastrophic Flood as described in the Bible is totally ruled out before the geological evidence is even examined.

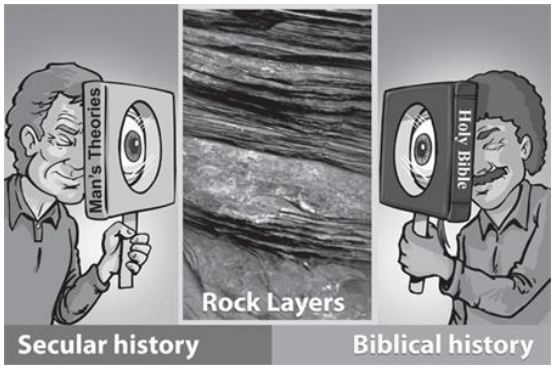


Figure 1. Two views of the rock layers: the world teaches that the vast majority of the rock layers were laid down slowly over millions of years; but in light of a global Flood in Genesis 6–9, it makes more sense that bulk of the rock layers that contain fossils were laid down during this catastrophe only thousands of years ago.

On the other hand, the description of the Flood in Genesis 6–8 is not hard to understand. We are told that the "fountains of the great deep" burst open and poured water out onto the earth's surface for 150 days (five months). Simultaneously, and for the same length of time, the "floodgates of heaven" were open, producing torrential global rainfall.[1]

The combined result was that the waters destructively rose across the face of the earth to eventually cover "*all* the high hills under the *whole* heaven." The mountains also were eventually covered, so that every creature "in whose nostrils is the breath of life" perished. Only Noah, his family, and all the air-breathing, land-dwelling creatures he took on board the ark were saved.
Based on that clear description of this real historical event, it is very rational to conclude that we should expect to find evidence today of billions of dead animals and plants buried in rock layers composed of water-deposited sand, lime, and mud all around the earth. And indeed, that's exactly what we do find—billions of fossils of animals and plants buried in sedimentary rock layers stretching across every continent all around the globe.[2] So instead of taking millions of years to form, most of the fossil-bearing sedimentary rock layers, as seen in the walls of the Grand Canyon and elsewhere, could have formed rapidly during the year of this global catastrophic Flood of Noah.[3]

It should immediately be obvious that these two interpretations of the evidence are mutually exclusive! Most of these rock layers are either the sobering testimony to Noah's Flood or the record of millions of years of history on this earth. One must be true and the other must be false. We can't consistently or logically believe in both, because the millions of years can't be fitted into the 370-day length of the global cataclysmic Flood of Noah described in Genesis 6–8. That is ultimately the fundamental reason why many old-earth advocates in the Christian community oppose the clear teaching of Scripture that the Flood was global. Only a relatively

insignificant local flood would fit with the secular geological interpretation of millions of years of slow and gradual geologic processes for most of the fossil record.

Biblical Problems

In order to relegate Noah's Flood to being only local in extent, and/or to being a myth, the Hebrew text of Genesis 6–8 and also the larger context have to be virtually ignored.

The Book of Genesis is clearly divided into two main sections. Chapters 1–11 deal with universal origins (the material universe, the plant and animal kingdoms, humans, marriage, sin, death, redemption, the nations of the earth, etc.). Chapters 12–50, on the other hand, concentrate on the particular origin of the Hebrew nation and its tribes, mentioning other nations only insofar as they came in contact with Abraham and his descendants.[4]

The realization of this fact of the context of the Flood account within the section of Genesis on universal origins sheds important light on the question of the magnitude of the Flood. Furthermore, the biblical account of the Flood catastrophe occupies more than 3 chapters of these 11 chapters on universal origins, while only 2 chapters are devoted to the creation of all things! How important, therefore, must the Flood account be! Yet nobody denies that the account in Genesis 1–2 of the creation of all things is referring to the scale of the whole earth, and indeed the whole universe. Thus the context of Genesis 6–8 demands that the scriptural narrative be understood to be describing a watery catastrophe of global proportions.

But when we read the Flood account itself, we see this conclusion confirmed. We are immediately struck with prolific usage of universal terms such as “all,” “every,” “under heaven,” and “in whose nostrils was the breath of life.” For example, *Genesis 6:7–13* tells us why God sent the Flood judgment:

The Lord said, “I will blot out man whom I have created from the face of the land, from man to animals to creeping things and to birds of the sky; for I am sorry that I have made them.” . . . God looked on the earth, and, behold, it was corrupt; for all flesh had corrupted their way upon the earth. Then God said to Noah, “The end of all flesh has come before Me; for the earth is filled with violence because of them; and, behold, I am about to destroy them with the earth” (NASB).

Note in particular God's emphasis on “all flesh” and “the earth,” not just some flesh or part of the earth. Also, note that the Flood came to destroy animals and birds, not just sinful humans. The Apostle Paul tells us in *Romans 8:19–23* that the whole non-human creation was subjected to the Curse because of man's sin, and thus the whole of creation suffers death and decay. So also in the Flood, the non-human creation suffered, regardless of whether animals or birds had come into close contact with sinful man or not.

Then when the Flood began, we are told in *Genesis 7:11–12* that “all the fountains of the great deep (were) broken up,” and “the rain was upon the earth.” Again, the words “all” and “the earth” are clearly intended to imply global extent. Indeed, this usage of universal terms is prolific as the Flood account reaches a crescendo in *Genesis 7:18–24*:

The waters prevailed, and greatly increased on the earth. . . . And the waters prevailed exceedingly on the earth, and all the high hills under the whole heaven were covered. . . . and the mountains were covered. And all flesh died that moved upon the earth . . . every creeping thing . . . and every man: All in whose nostrils was the breath of the spirit of life, all that was on the dry land, died. So He destroyed all living things which were on the face of the ground. . . . They were destroyed from the earth. . . . And the waters prevailed on the earth one hundred and fifty days.

Figure 2. A flood that covered the highest hills by a significant amount, yet was local does not make sense!

So frequent is this use of universal terms, and so powerful are the points of comparison ("high hills," "whole heaven," and "mountains"), that it is extremely difficult to imagine what more could have been written under the direction of the Holy Spirit to express the concept of a global Flood! In the words of a leading Hebrew scholar of the 19th century, who strongly opposed those who tried to tone down the universal terms of the Genesis Flood account:

> They have distorted the spirit of the language, and disregarded the dictates of common sense. It is impossible to read the narrative of our chapter (*Genesis 7*) without being irresistibly impressed that the whole earth was destined for destruction. This is so evident throughout the whole of the description, that it is unnecessary to adduce single instances. . . . In our case the universality does not lie in the words merely, but in the tenor of the whole narrative.[5]

Something else in the Flood account is irreconcilable with the Flood being localized in the Mesopotamian Valley. In *Genesis 7:20* we are told that "the mountains were covered." Because water always seeks its own level, how could the mountains only be covered in one local area without also covering the mountains in all adjoining areas and even on the other side of the planet (Figure 2)? This clear statement in God's Word only makes physical and scientific sense if the Flood were global in extent.

Even the renowned and theologically liberal Hebrew scholar James Barr, then Oriel Professor of the Interpretation of Holy Scripture at Oxford University in England, was prepared to admit in a letter to David C.C. Watson dated April 23, 1984:

> . . . so far as I know, there is no Professor of Hebrew or Old Testament at any world-class university who does not believe that the writer(s) of Genesis 1–11 intended to convey to their readers the ideas that . . . Noah's Flood was understood to be world-wide and extinguish all human and animal life except for those in the Ark. Or to put it negatively, the apologetic arguments which suppose . . . the flood to be a merely local Mesopotamian flood are not taken seriously by any such Professors, as far as I know.[6]

Theological Problems

If the Flood were only a relatively recent local event of no geologic significance, then the fossil-bearing sedimentary layers that were supposedly laid down over millions of years must have preceded the appearance

of man on the earth, including Adam. After all, man only appears very recently in the fossil record. For a Christian who accepts the millions of years, this would mean that animals were living, dying, suffering disease, eating each other, and being buried and fossilized prior to Adam's appearance in the Garden of Eden. In the geologic record we find the fossilized remains of fish eating other fish, animals eating other animals, animals with diseases like cancer, and much more, which indicates that these fossils are a record of disease, violence, and death.

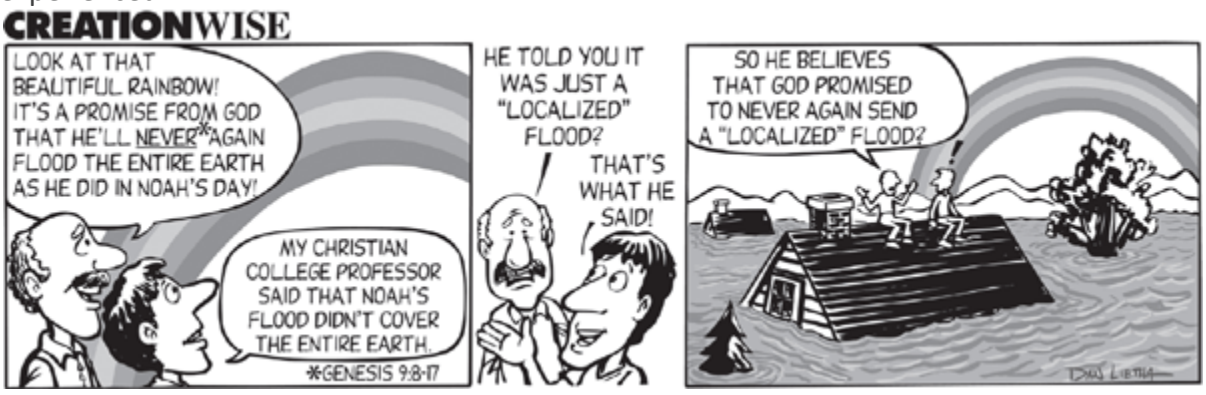
However, theologically there is a big problem here. In *Genesis 1:30–31* we are told that when God created all the animals they all were vegetarians, and that God was pleased with everything that He had created because it was "very good." This means that all of creation was perfect when measured against the goodness of God—the only standard God uses (*Matthew 19:17*).

Furthermore, it is not until after God pronounced the Curse on all of creation because of Adam and Eve's disobedience that we are told that the ground would bring forth thorns and thistles (*Genesis 3:17–18*). But the evolutionary geologists tell us that there are fossilized thorns in Canadian sedimentary layers that are supposedly 400 million years old.[7] The Bible-believing Christian cannot accept this age-claim however.

If the plain statements of God's Word have any authority, then these fossilized thorns could only have grown after the Curse, after Adam was created by God. So the geologic record in which these fossilized thorns are found could only have been deposited after the Curse. However, the only event after the Curse that could have been responsible for burying and fossilizing these thorns, and the billions of other plants and animals we see in the vast rock layers of the earth, is the year-long Genesis Flood. This then rules out the millions of years.

Another theological problem arises when we come to *Genesis 9:11–15*. God made a promise to Noah and his descendants that "never again shall there be a flood to destroy the earth." In other words, God was promising never to send another event like the one Noah experienced, where we are told specifically in *Genesis 7:21* that "all flesh died."

Obviously, if the Flood of Noah were only local in extent, then because we have seen lots of local floods since the time of Noah, that have destroyed both man and animals, God has broken His promise many times over! To the contrary, this rainbow covenant God made with Noah and his descendants could only have been kept by God if the Flood were global in extent, because never since in human history has a global flood been experienced.



The Views of Jesus and the New Testament Authors

The Lord Jesus Christ, God's living Word (*John 1:1–3*), made special reference to Noah and the Flood in *Luke 17:26–30*, where He said that, "the Flood came and destroyed them all."

There is no biblical or logical reason to assume that all of pre-Flood humanity was living in the Mesopotamian Valley. *Genesis 4* indicates that early man built cities, had nomadic herds of animals, invented things, and explored the earth (v. 17–22). So if all the ungodly globally on the earth will be judged when He comes again, when Jesus by way of comparison describes the Flood and all the ungodly being destroyed by it, then He was saying that the Flood also was global.

Similarly, the Apostle Peter in *2 Peter 3:3–7* warned of last-days scoffers who would wilfully forget that after the earth was created by God, it perished, "being flooded with water," and that the present earth is "reserved for fire until the day of judgment." There are three events he is thus referring to: the creation of the world (Greek *kosmos*), the destruction of that world (Greek *kosmos*) by a watery cataclysm (the Flood), and the coming destruction of the heavens and the earth by fire in the future.

In context, it is clear that Peter had to be teaching the Flood was global, because the creation of the world was global, and the future judgment by fire will also be global. Indeed, the use of the Greek term *kosmos* for both the world that was created and the world that was flooded leaves us no doubt that the Apostle Peter, under the inspiration of the Holy Spirit, was teaching that the Flood was global in extent.

Scientific Problems

If the Flood were only local in extent, why did Noah have to take birds on board the ark (*Genesis 7:8*), when the birds in that local flooded area could simply have flown away to safe unflooded areas? Similarly, why would Noah need to take animals on board the ark from his local area, when other representatives of those same animal kinds would surely have survived in other, unflooded areas?

Indeed, why would Noah have had to build the ark to the scale specified by God (*Genesis 6:15*)—300 cubits long, 50 cubits wide, and 30 cubits high, or approximately 450 feet long, 75 feet wide, and 45 feet high? With these dimensions, the total volume of the ark would have been approximately 1.45 million cubic feet, and with three decks it would have had a total deck area of approximately 98,800 square feet, equivalent to slightly more than the area of 20 standard basketball courts! The gross tonnage of the ark would have been about 14,500 tons, well within the category of large metal ocean-going vessels today.[8]

Quite obviously, an ark of such dimensions would only be required if the Flood were global in extent, designed by God to destroy all animals and birds around the world, except for those preserved on that ark. Indeed, because the Bible implies that Noah was warned 120 years before the Flood came (*Genesis 6:3*), God could have simply told Noah and his family to migrate with any required animals and birds out of the area that was going to be flooded.

In Genesis 1:28 we are told that God commanded Adam and Eve to fill the earth. Adam and his descendants' life-spans were hundreds of years, in which they would have had ample time to produce many children. The chronological framework from Adam to the Flood based on the genealogies given in *Genesis 5* indicates a period of 1,656 years for the human population to grow and spread around the earth in obedience to God's command.

Depending on the assumptions used for the number of children in each family, one could easily calculate, using a standard population growth equation, that the human population at the time of the Flood could have been up to a billion or more people. If so, there is no question that they would have spread beyond some localized area, and thus have required a global Flood to destroy them all. God gave a similar command to Noah and his descendants after the Flood to fill the earth (*Genesis 9:1, 7*), and in a matter of about 150 years God judged them for not obeying that command. Clearly, in the 1,656 years between Adam and the Flood,

with the number of people in the pre-Flood population, the earth would have been filled, which is confirmed by God's assessment in *Genesis 6:13* that because the earth was filled with violence through man's sinfulness He would destroy them "with the earth," obviously necessitating that the Flood judgment was of global extent.

Conclusions

This has only been a brief survey of the problems associated with the local Flood view designed to accommodate the supposed millions of years of earth history. The Lord Jesus Christ and the Apostle Peter clearly taught that the Flood of Noah was global in extent, and both the context and the descriptive words used in Genesis 6–8 quite plainly describe the Flood as global in extent.

It wasn't until popularization of the belief in geology that only slow and gradual geological processes formed the geologic record over millions of years that the local Flood compromise became increasingly popular. Yet the Scriptures are clear that the deaths of animals and man only came into the world as a result of the Curse. So the fossils must have been produced after that tragic event. The subsequent global Flood could have produced most of the fossil-bearing sedimentary layers, including the fossilized thorns we find.

And Noah would not have needed to build an ark or take animals on board if the Flood were only local, as there was plenty of warning to escape to another region. These and many more biblical, theological, and scientific considerations make the local Flood compromise totally untenable. This is all ultimately about the authority of *all* of God's Word, which plainly teaches that the Flood of Noah was global in extent.

Footnotes

1. The reference to 40 days and 40 nights (*Genesis 7:12*, *17*) appears to be telling us how long it was before the ark started to float, for the windows of heaven were closed on the same day (150th) as the fountains of the deep were (*Genesis 7:24–8:3*). For a detailed argument based on the Hebrew text see William Barrick, "Noah's Flood and its Geological Implications," in Terry Mortenson and Thane H. Ury, eds., *Coming to Grips with Genesis* (Green Forest, AR: Master Books, 2008), p. 251–282.
2. See chapter 29 in this volume: Andrew A. Snelling, "What Are Some of the Best Flood Evidences?"
3. Some localized fossil-bearing deposits may have formed after the Fall of Adam and Eve in sin and before Noah's Flood, and some of the localized fossiliferous rock layers at the top of the geological record were formed in post-Flood events. But creationist geologists are in general agreement that most of the fossil-bearing sedimentary rock record is a result of Noah's Flood.
4. W.H. Griffith Thomas, *Genesis: A Devotional Commentary* (Grand Rapids, MI: Eerdmans, 1946), p. 18–19.
5. M.M. Kalisch, *Historical and Critical Commentary on the Old Testament* (London: Longman, Brown, Green, et al., 1858), p. 143-144.
6. Copy of this letter on file.
7. W.N. Stewart and G.W. Rothwell, *Paleobotany and the Evolution of Plants* (Cambridge, UK: Cambridge University Press, 1993), p. 172–176.
8. For fuller details regarding the size and construction of the ark, see Tim Lovett, *Noah's Ark: Thinking Outside the Box* (Green Forest, AR: Master Books, 2008).