The Universal nature of the Flood

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Was the flood of Genesis universal, covering all the earth or was it local, merely covering a small area of the earth? This question has often troubled many readers of the Genesis story.

For many, evolution is the foundational underpinning for the geological and biological sciences (To learn more about this topic order your free copy of *Creation or Evolution Does It Really Matter What You Believe*?). Since evolution is so widely accepted many believe that the geological record can only be interpreted using evolutionary guidelines. These evolutionary guidelines supposedly show that the present is the key to the past. According to this concept, often called uniformitarnism, since there are no earth wide floods occurring now there have been none in the past.

Many compromising readers of Genesis in order to not offend the scientific community have given in to the concept of a local flood. The Bible is very clear on the magnitude and scope of the flood. That the earth was indeed covered by an earth wide flood can be proven by the Biblical story.

How long did the flood last? Many believe that the rain merely lasted 40 days and 40 nights. Then after a short period the earth was dry and ready for Noah and the animals. They fail to realize how long the flood episode lasted. The flood lasted for *371 days* (compare Genesis 7:11 and Genesis 8:14-15). During this time period the earth was covered by water for 150 days. "And the waters prevailed on the earth one hundred and fifty days" (Genesis 7:24).

How deep and how widespread was the water? The Bible indicates that the tops of all the mountains all around the world were covered to a depth of 15 cubits or about 22 ½ feet (Genesis 6: 20). Even if the antediluvian mountains were smaller this is still an enormous amount of water (Psalms 104:5-9).

Another indication of the hydrological forces involved can be gathered in the following verses: "… and behold, I will destroy them with the *earth*" (Genesis 6:13). The earth would also be destroyed along with wicked humanity. This principle is repeated again at the conclusion of the flood. "… Never shall all flesh be cut off by the waters of the flood; never again shall there be a flood to *destroy the earth* (Genesis 9:11). The flood of Noah was an earth wrecking experience. The earth after the flood was different then the earth that existed before the flood. Many geological formations stand as natural witnesses to the destructive force of the flood.

The need for the ark is proof of the magnitude of the flood. If the flood were a local flood it would have been a simple matter for Noah to move. There would have been no need for the gathering of all the animals and Noah's family into the ark. The Bible reveals that the flood was of such a magnitude that provisions were made to insure the survival of both humanity and the animals. The whole point of building the ark would have been meaningless if the flood was local.

The New Testament bears abundant evidence that its writers considered an earth wide flood a historic event. "For this they willfully forget: that by the word of God the heavens were of old, and the earth standing out of water and in the water, by which the *world that then existed perished*, being flooded with water. (2 Peter 3:5-6). In these

verses the apostle Peter plainly comments on the veracity of a global flood. Interestingly he states that even during his time some people "willfully forget" the obvious.

Jesus Christ also understood the flood from the same perspective. He used the flood as an example in his teaching. "And as it was in the days of Noah, so it will be also in the days of the Son of Man…until the day that Noah entered the ark, and the *flood came and destroyed them all*" (Luke 17:26-27).

Misconceptions about the ark

Many people are under the false assumption that the ark could not possibly have carried all of its intended cargo. Scoffers of the Genesis story often picture the ark as a small vessel, complete with the giraffe's head sticking out the front and the elephant's tail sticking out the back, sinking under the weight of an overloaded cargo of millions of animals. This concept is based on several misconceptions.

A cursory reading of the sixth chapter of Genesis will reveal some often overlooked, but very important details. The Bible nowhere states that Noah would have to take on board the ark representatives of *every* living creature. There were three requirements for the animals that were going to be loaded on the ark. These requirements were 1) air breathing, 2) terrestrial, 3) interbreeding animals, often called by the Biblical term—*kind*. "And behold, I Myself am bring floodwaters on the earth, to destroy from under heaven all flesh in which is the *breath of life*; everything that is *on the earth* shall die…And of every living thing of all flesh you shall bring two of every sort into the ark, to keep them alive with you; they shall be male and female. Of the birds after their *kind*, of animals after their *kind*…" (Genesis 6:17,19-20).

Species and the Biblical Kind

The word species and the biblical word "kind" are often used interchangeably. This is incorrect since they are not synonymous. The biblical word "kind" denotes an organism that reproduces others like itself. The species concept is much narrower than this. Therefore many species can be included in a single biblical "kind." The word kind is probably closer to the modern taxonomic unit of genus, and in some cases the larger taxonomic unit, family.

The Canidae (canine) family includes about 14 genera of dog like animals. These include the coyote, dog, wolf, jackal, etc. The ark did not have to contain the hundreds of species of canines that make up this group. In reality, these were all represented by a few "kind." These "kind" would then produce all the animals that make up the Canidae family. For example all of the hundreds of varieties of domestic pigeons that have all been produced originated from one species, the wild rock pigeon *(Columbia livia).*

The ark *was not* required to carry every species (possibly numbering in the millions) of animal. The ark *was* required to carry every Biblical kind (numbering in the few thousands) of terrestrial, air breathing animals.

In reality the majority of the animals would not have been taken on board the ark. The reason is obvious; enough representatives would have survived the flood without any assistance from Noah. These would have included all aquatic dwelling animals, such as the crustaceans (lobsters, crab, etc.), salt and freshwater fishes, echinoderms (starfish, sea

urchins), mollusks, worms, corals, sponges, and myriad of other animals that do not live on dry land. This category would even include such mammals as the whales, porpoises, seals, walruses and many other mammals that live in aquatic environments, because even though they have the breath of life they do not live on land. Some reptiles and most amphibians would also fall into this category.

Other animals that are terrestrial but do not have the breath of life would also survive outside the ark. These would include insects and protozoan.

God reiterates this point when He describes the kind of animals that perished during the flood. These were specifically the type of animals that Noah was told to take on board the ark. "And all flesh died that *moved on the earth*: birds and cattle and beasts and every creeping thing that creeps on the earth, and every man. All in whose nostrils was the *breath of… life, all that was on dry land died*" (Genesis 7:21-22).

When a statistical approach is used it is easy to see that the ark could have carried its intended cargo (see box). According to John Woodmorappe (*Noah's Ark: A Feasibility Study*, 1996, p.7) the amount of animals that Noah would need to have in the ark would number between 2,000 and 16,000.

Immense size of the ark

The second of these misconceptions is the size of the ark. In reality the ark was an immense ship. Let's examine the Biblical record to gain an appreciation of its dimensions. Notice what God instructed Noah. "Make yourself an ark of gopherwood; make rooms in the ark, and cover it inside and outside with pitch. And this is how you shall make it: The length of the ark shall be three hundred cubits, its width fifty cubits, and its height thirty cubits. You shall make a window for the ark…You shall make it with lower, second, and third decks" (Genesis 6:15-16).

A cubit is approximately 18-inches. Most Hebrew scholars believe the cubit to have been between 17½ -21½ inches long. This means that the ark would have been 450 feet long, 75 feet wide and 45 feet high if the 18 inch cubit was used. If a larger cubit was used it would have been proportionately longer.

The displacement tonnage of the ark, which is the weight of water it would displace at a draught of 15 cubits, would be almost 22,000 tons. By comparison the U.S.S. Salem, a large heavy cruiser, 716 ft long, commissioned in 1949 has a displacement tonnage of 21,500 tons. The ark's gross tonnage, which is a measure of cubic space (100 cubic feet is one gross ton), would be 15,100 tons. Its total volume would have been 1,518,000 cubic feet. This would equal the capacity of 569 modern railroad stock cars. The standard size for a stock car is 44 feet long with a volume of 2670 cubic feet. This would make a train more than 5 ½ miles long.

The deck space for the ark would be over 101,000 square feet. This would be more floor space than 21 standard college basketball courts. By comparing the measurements of the ark it is easy to see that it would be comparable to today's ocean going vessels. It was probably the largest vessel of its type built until the late 1800's when metal ships were first constructed (John Whitcomb and Henry Morris, *The Genesis Flood*, 1998 edition, p.10).

The ark was built on a 1:6 ratio (50 cubits:300 cubits). The science of naval architecture reveals that this is an extremely stable width to length ratio. Most ocean

going "hopper barges" use this same ratio in their design. It is estimated that the ark could easily have survived even the largest of ocean waves. If the ark were equipped with a dragging stone anchor, it would have been properly positioned to meet any size ocean wave. The design of the ark would have made it almost impossible to turn over.

The ark was simply a floating barge-like craft. The Hebrew word for ark is *box*. It did not need a prow (point) or rudder. It did not need any sails or any other type of propulsion it simply had to float. Since it was constructed in a box-like configuration this would increase the interior carrying capacity.

Caring for the animals

Many scoffers of the Genesis Flood state that it would have been impossible for the 8-person crew of the Ark to have adequately cared far all the animals. The reason is because of a common misconception that ancient people were very ignorant and not as advanced as we are today. Although it is true that we have more technology at our disposal today the ancients were nevertheless very ingenious. Consider the seven wonders of the ancient world, which included the pyramids of Egypt and many other notable manmade works. Many of these works have not been duplicated since. Much time would have been saved in the care of animals if labor saving devices were incorporated into the design of the ark.

In reality most of the animals would have required very little if any care once loaded onto the ark. With the proper technology Noah could have built cage and confinement systems that would require very little human attention and would be self-sustaining.

Food, water and waste

The ark undoubtedly made use of self-feeding, self-watering, and self-cleaning technologies. These technologies were common knowledge in the ancient world.

These cages would use a mesh type cage floor and slanted waste system, which moves animal wastes into a gutter. Once in the gutter the excreta could have been allowed to either dry (becoming odorless and inert), or be biologically composted by earthworms and bacteria, or it could have been dumped overboard by means of a slanted trough leading to the exterior. For the larger animals the stalls could have been built with slatted floors. These containment areas would be large enough to allow the wastes to collect and become dry and inert. None of the waste would require human handling.

Food would have been preloaded into a chute or container on the side of the cages and the animals could self feed. Enough food would have been loaded into the chutes to last for long periods of time. Extra food would have been located in overhead bins or near by. This same technique is used today in the animal industry to increase labor efficiency. This would greatly reduce the time needed to feed the various animals.

Water would be piped to self-filling bowl/troughs. The water would be gathered through a rainwater cistern system or would have been preloaded before the flood. Ancient people commonly made indoor pipes from reeds, clay, and bamboo tubing.

The ark *was not* a floating zoo. Animals kept in a zoo require much room, specialized food, and individual attention. The ark was an emergency vessel built by

Noah under God's guidance. It was more in keeping with the conditions found in modern animal laboratories or mass production animal factories, which are crowded but relatively clean environments.

It is possible that many animals, which are not considered classic hibernators, have the latent ability to greatly lower their metabolic rate (Terry Vaughan, *Mammalogy*, 1986, p.421, 469-471). This lowered metabolic rate can be brought on by several factors. These include, temperature fluctuations, unavailability of food and water, variability of light and other environmental stimuli. Many rodent and small mammals go into torpor during the course of their daily cycle. During this torpor animals do not eat, drink or produce any waste. Although the ark's crew could have easily cared for all the animals this would have been *greatly reduced* if only part of the ark's inhabitants had either hibernated or gone into torpor.

It is evident, when all the facts are considered, that the crew of the Ark could easily have cared for thousands of animals. Data from animal husbandry studies have shown a few people can care for tens of thousands of animals (John Owen, *Cattle Feeding*, Farming Press Limited, Suffolk, Eng., 1983, p.101 & E.C. Miller and E.F. Hodges, "One man feeds 5,000 cattle or 60,000 broilers," *1970 Yearbook of Agriculture (USA) for 1970*, p. 57).

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Animal Space Calculations

Most animals are not very large. When we think of animals we tend to think of large animals such as elephants and horses. In reality the average size of all animals, according to most biological authorities, is the size of a sheep. Other authorities state the average size would be even smaller, about the size of a small rodent such as a rabbit. One railroad stock car can carry about 240 sheep and each stock car has a capacity of 2670 ft^3 Therefore each sheep requires 11.125 ft^3. This would mean that all 16,000 animals could fit in 66 railroad cars. Since the arks total capacity was 569 stock cars the 16,000 animals would require less than 11.7% of the ark's space. In other words all the animals could fit on a portion of one of the ark's three decks. This would leave the other 88% of the ark's space for Noah's family, food, supplies, baggage, and interior struts and construction supports.

Since there is some doubt as to what is the average size of the animals that were brought into the ark, and this article is a conservative analysis of the carrying capacity of the ark, we will use the larger sheep average. We will also base our calculation on three different occupancy estimates. The first two figures of 2,000 and 16,000 are based on the work of Woodmorappe. The figure of 2,000 is based on the biblical kind being equivalent to the taxonomic rank of family. The 16,000 figure is based on the biblical kind being equivalent to the taxonomic rank of genus. The final figure is an enlarged estimate of 40,000. Even though this is many times more than the ark would have to carry, this large figure should satisfy even the most skeptical.

The following calculations show the amount of the ark space that would be required to carry the stated number of animals, the average size of a sheep. The cubic capacity of the ark was 1,518,750 ft^3 based on the 18 inch cubit.

Volume of the Ark = 450 ft × 75 ft × 45 ft = 1,518,750 ft^3

If the cubit was larger the capacity of the ark would have been larger and the animals would have taken up less space. Also if the average animal size is indeed the size of a small rabbit the calculations shown below could be reduced by a factor of almost three.

2,000 animals x I1.125ft^3 = 22,250 ft^3 or $\frac{22{,}250\ ft^3}{1{,}518{,}750\ ft^3} \times 100 =$ **1.4%** of the Ark's capacity
(kind = taxonomic rank of family)

16,000 animals x 11.125ft^3 = 178,000 ft^3 or $\frac{178{,}000\ ft^3}{1{,}518{,}750\ ft^3} \times 100 =$ **11.7%** of the Ark's capacity
(kind = taxonomic rank of genus)

40,000 animals x 11.125ft^3 = 445,000 or $\frac{445{,}000\ ft^3}{1{,}518{,}750\ ft^3} \times 100 =$ **29%** of the Ark's capacity

Notice that even though we use the inflated figure of 40,000 animals, the smaller cubit of 18 inches, and the larger animal average (sheep vs. rabbit) the ark would still only be 29% full!

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