



## Noah's Ark: A Feasibility Study

by [Glenn Morton](#)

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### Noah's Ark: A Feasibility Study

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298 pp.

By John Woodmorappe

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#### Disclaimer

Judging by the number of citations, this book is far and away a reaction to R.A. Moore's 1983 article "[The Impossible Voyage of Noah's Ark](#)," *Creation/Evolution* 11:1-43 (130 citations). At every turn Moore's name and ideas are being countered or attacked. Respectively the second and third most attacked books were far behind Moore. These are: my book, [Foundation, Fall and Flood](#) 1995, (29 citations) and I.R. Plimer's 1994 book [Telling Lies for God](#) (28 citations). Usually, when my book was cited, attached to the citation are adjectives like "absurd", "naive", "compromising", "abysmally ignorant", "sloppy", "reckless disregard", "extremely inaccurate", "misleading", "tomfoolery" and "intentionally deceitful". Because of this, intellectual honesty demands that the reader of this review be notified of this possible conflict of interest.

#### Review

**W**oodmorappe's book is an impressive attempt to defend the concept of a global flood in which the entire land biosphere was saved by the ark. One of the characteristics of anything Woodmorappe writes is an extensive bibliography and this book is no exception. The book is well documented, having an estimated 1400 references. This makes the book an excellent bibliographic source, for *entré* to the literature of any issue as one is reading it. The book lacks an index which is a serious impediment to the usefulness of the book for further study and research. One of the best things is that there are few issues concerning the Ark which are not addressed. Because of this, anyone with a serious interest in the ark and its problems, or a student of the creationist movement should obtain a copy.

Woodmorappe attacks the problems of the ark in a systematic fashion. He begins by calculating how many animals were on the ark. Woodmorappe uses the genera as the equivalent of the created kind. Taking one pair from each genera, living and fossil, he lists 7428 mammals, 4602 birds and 3724 reptiles on the ark. This totals to 15,754 animals on the ark. Amphibians and invertebrates like terrestrial snails

#### Other Links:

[Noah's Ark: A Feasibility Study](#)

The web site for the book reviewed for this article.

[A rebuttal to this article](#)

John Woodmorappe replies to this article.

[Foundation, Fall and Flood](#)

The web site of Glenn Morton, the author of this article.

[Problems with a Global Flood](#)

Mark Isaak details the many factual problems with taking the Ark story from Genesis as literal history and world-wide in scope.

are not on the ark. He spends very little space describing how these animals could have survived out in the turbulent flood waters.

Woodmorappe continues through the topics of living space, food and water requirements, waste removal, heating and ventilation, the gathering of the animals, manpower needed for the care of the animals and on to post flood problems such as the re-migration and the re-development of genetic diversity.

Woodmorappe does a good job of addressing all the issues. But many of his solutions are less than satisfying.

Woodmorappe attempts to solve the feeding and care problems by comparing the ark to modern mass production farming methods. But there is no justification given to approaching the problem in this fashion. It is not clear that solutions applicable to the care of 8,000 hogs, requiring the same food, water and space, can be applied to 8,000 different animals each requiring a different set of food, water and environmental conditions. Every care and feeding problem is attacked by this approach. And yet he suggests that some of the snakes can be coaxed into eating inert food by stuffing snake skins with meat. He notes that pandas can survive on diets lacking bamboo, but a check of the references shows that the replacement diet is more time-consuming to create than bamboo. This type of feeding is precisely why so many have wondered whether Noah and company had sufficient time to feed thousands of animals.

When it comes to care on the ark, Woodmorappe enlists the aid of the animals themselves. According to Woodmorappe, prior to the flood, Noah had kept a menagerie and trained the animals to defecate and urinate on command into buckets. They were also trained to leave their pens for exercise and return to their cages on command. Snakes and bats were trained to take inert food. Birds were trained to take sugar water from pots. This, of course, makes Noah the greatest animal trainer in history. How much time Noah and his hired hands required to train 16,000 animals is almost incalculable.

Noah is also turned into a breeder *par excellence*. During the time of the menagerie, Noah was engaged in modern breeding in order to "maximize the heterozygosity of the recessive alleles" to avoid inbreeding depression after the flood (p. 194). If hibernation was a desirable trait, Noah was able to breed strains of animals which were more likely to hibernate (p. 133). He was able to acclimatize reptiles to the temperatures they would find on the ark (p. 124) and breed a pair of Koalas who would accept dried Eucalyptus leaves. This type of solution is appealed to so often, it begins to take on the appearance of an *ad hoc* explanation.

Many of the solutions are of the nature of a "could be, might be". He suggests that the seeds of some plants were buried and then eroded back to the surface in order for them to survive the flood. He writes:

"The absence of light and the anoxic conditions of burial must have facilitated the dormancy of seeds until unearthed by late-Flood and post-Flood erosive events. Furthermore, the absence of oxygen tends to greatly prolong the viability of seeds which are viable only for short periods of time under normal subaerial conditions. Had carbon dioxide percolated through some of the Flood-deposited sediments, it must have also imposed a narcotic effect on many seeds, including at least some that would not otherwise have survived prolonged burial in a viable condition. For instance, the rubber plant (*Hevea brasiliensis*) is notorious for the short period of viability of its seeds under normative conditions. Yet when narcotized by carbon dioxide, the seeds can survive in a viable state for at least several weeks and, if present in sufficient numbers, a few individual seeds out of a great number of initially buried may have survived the Flood year." p. 156.

Since CO<sub>2</sub> is normally associated with volcanism and high thermal gradients, an explanation of where the CO<sub>2</sub> came from would seem to be in order. None is given.

There are some serious drawbacks to the book. First, as noted in the disclaimer, Woodmorappe resorts to lots of name calling when he does not like an adversary's argument. Plimer is called Moore's "parrot" (p.

21), echo (p. 37). Moore is called "naive"; is accused of having "fantasies" and displaying "ignorance." Opponents "imagine" their arguments. All this name calling is a distraction from Woodmorappe's points.

Several arguments are not self-consistent. An example is the following:

"After raising some transparently absurd problems of snails and earthworms (animals not on the Ark) migrating to the Ark, Morton (1995, p. 69) then dusts off the old chestnut about the slow-moving sloth needing practically forever to reach the Ark from South America." (p. 60)

Thus one is left assuming that earthworms are not on the ark. But earlier in the book, Woodmorappe had appealed to earthworms as the agent for decomposing and handling solid waste (p. 34-35). And later, he says that snails were on the ark for food (p. 101). Inconsistencies like this abound throughout the book.

Another example of inconsistencies is on page 202 where in his discussion of the Major Histocompatibility Complex (MHC) he says that the DRB1 locus has 106 known alleles. Five pages later, he says it is 44.

Many of the arguments depend upon mathematical calculations which are not displayed, either in footnotes or appendices. This leaves the mathematically oriented reader wondering if the mathematics was correct. He claims that calculations show ark animals produced between 6 and 12 tons of airborne moisture. None of the assumptions are displayed to allow the reader to evaluate such a claim. Calculations of the heat production by animals in the ark are claimed to show that there is no problem with this issue, but the lack of calculations force the reader to depend upon the author for the validity of that statement.

Woodmorappe's tables are confusing, and abridged and because of this it is difficult to check out the mathematical accuracy of his arguments. For instance, in Table 1 he divides the animals on the ark into 8 weight divisions for each class: reptiles, birds and mammals. Thus one would think that there are 24 categories (3 X 8). Table 2 lists the same data for 25 orders, then abridges the remaining 61 land vertebrate orders (which means 61 categories). One can not figure out why this table is published. By the time the reader gets to table 4, which calculates the amount of food required to feed the animals for 371 days, Woodmorappe, giving only a reference, uses a totally unexplained equation (and we discover that there are 32 categories of animals. But these 32 categories are not explained and why there are now more than 24 categories, is also unexplained). Table 5, which calculates drinking water requirements, adds to the confusion by citing only 27 categories of animals which drink water. Either three categories don't eat food or five don't drink water.

Woodmorappe states (p. 27) that the urine could be drained overboard by gravity. He does not tell how this is possible from the lowest floor level which was below the water line. At one point he suggests that the animals could be trained to urinate and defecate upon command while someone holds a bucket behind the animal. Assuming that this can be accomplished for the largest quarter of the animals and that they need to be serviced three times per day, each person must service 125 animals per hour, 2 animals a minute. What a fun job that must have been.

Woodmorappe's treatment of the heat generated up by the animals is quite unworkable. He claims that reptiles give off no heat. This is not true. Their metabolism, while slower than mammals and birds does indeed give off heat. He uses units no physicist would approve of -- Kg heat-producing biomass per cubic meter. If he gives a definition of how much heat is generated by such a unit, I have been unable to find it. Thus, it is impossible to verify his assertion that the animals would not overheat the ark. He relies on wind entering the upper level to cool and ventilate the ark. His calculation is merely wind speed times the window area. But anyone who has ever performed a fluid flow calculation will know that you can not calculate the problem in this fashion. Hydrodynamic equations must be used and friction taken into account. His method for calculating air flow is far too simple.

Woodmorappe claims that the animals respire 6 to 12 tons of airborne water vapor each day. He implies that the inside of the ark would have low humidity (another inconsistency). He writes:

"Morton (1995, p. 71) has embellished Moore's argument with the totally baseless charge that the Ark must have been 'anything but dry' inside. Of course, in order to preserve grain, it is necessary not only to dry it, but also to prevent moisture from seeping back into it. Even if Morton (1995) were correct about the wetness of the interior of the Ark, it need not have doomed the feedstuffs and seeds to ruin, as the materials could have been stored in water-tight containers." (p. 92)

Woodmorappe forgets that during the first 40 days and nights, when he opens the windows to ventilate the ark, he opens it onto a world which is raining. Rain only occurs when the relative humidity is 100%. Thus, the fact that 6-12 tons of water were exhaled into the already saturated air inside of the ark, requires that 6 to 12 tons of water per day during the 40 days of rain would condense onto the walls of the ark. Since this condensation would drip to the bottom floor. Without the water being pumped overboard, this would represent a puddle of water on the floor of the ark 7 centimeters (3 inches) deep. The Ark, even under Woodmorappe's scenario, would have been "anything but dry".

Animals outside of the ark were supposed to have survived in pockets of floodwater suitable to their requirements (whatever those requirements were). He appeals to gradual acclimatization of amphibians and fish to the salinity of the flood waters. But exactly how a global flood was able to gradually occur is unexplained. He has plankton be buried and then re-excavated to survive the flood.

To my suggestion that the carnivores when released, would start eating the few survivors of the Flood, Woodmorappe suggests that large numbers of carcasses which had been buried early in the flood were re-excavated and used as food for the carnivores. This would allow the prey species enough time to replenish their numbers. He cites several studies of carnivores eating carrion, but none citing cases of carnivores eating year-old carcasses.

The most interesting post-ark problem Woodmorappe discusses concerns the genetic diversity. Unfortunately, Woodmorappe appeals to a period of rapid mutation after the flood to restore genetic diversity. Very little justification for this is given. Having rejected the accepted rates of molecular clocks Woodmorappe is forced to talk about "mutator genes" which cause mutations, radioactivity and the mutagenic effects of a stressful environment (citing a creationist source). He refers to a "burst of mutations among Noah's immediate post-Flood descendants". This appeal to phenomenon with no apparent cause occurs far too frequently.

To his credit, Woodmorappe is the first creationist I know of to actually discuss the pseudogene problem. His attempted solution depends upon an article by Carlton (1995) which says that a retrovirus can turn a normal gene into a pseudogene. However, he does not explain why processed pseudogenes are found at the same locations in chimp, gorilla, gibbon and man but not on other species.

Some of the stranger claims of the book:

On page 43 and p. 93 he claims that hydroponic vegetables can be grown in total darkness on the lowest level of the ark.

On page 44 he claims "I now consider non-biological sources of flameless illumination. There are many references to 'luminous gems' in ancient literature, along with an apocryphal account of luminous pearls being used on the Ark."

On page 188 he writes: "Furthermore, a single pair of founders most definitely can have the same genetic diversity as fifty founders, and without any miraculous or unusual procedures."

## **Conclusion**

Woodmorappe's book was interesting reading for an ark aficionado. Others may find parts a little too detailed for their likes. But anyone with a serious interest in these problems should own their own copy.

## Postscript

Woodmorappe has [responded to this review](#). Fairness requires that I give that reference. Please come back here when you are finished reading it.

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