

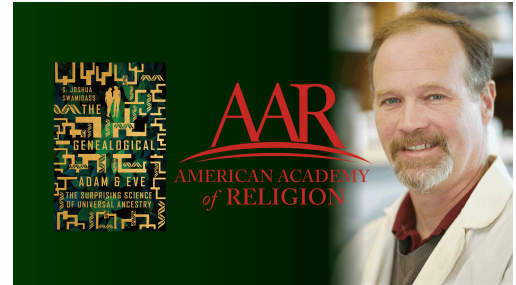


Eden Reconsidered

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in *The 2020 Annual Meetings of the American Academy of Religion and the Society of Biblical Literature*

<https://doi.org/10.54739/egme>



Joshua Swamidass' book, *The Genealogical Adam and Eve*¹, is a bold attempt to resolve one of the most basic conflicts between science and faith. There is no question that the Genesis story of Adam and Eve matters. This Biblical narrative links the creation of humanity directly to Divine will, and forms a theological foundation underpinning not just Christianity, but all the Abrahamic faiths. As such, it may be viewed as a literal account of the origins of our species from a single couple or taken as the symbolic representation of the intimate relationship between God and his chosen creatures.

While many fundamentalist believers are quite aware that a literal reading of the Genesis narrative is roundly contradicted by the sciences of geology and biology, they nonetheless find such a reading to be theologically necessary. As creationist Ken Ham has said, "If Christians don't believe in a literal Genesis, they have no foundation for their doctrine."² In plain terms, the validity of the Genesis account, including the story of Adam and Eve, speaks to the authority of Scripture itself. As a result, the desire to preserve Scriptural authority accounts for much of the opposition to evolution, and especially to its inclusion in the public school curriculum. What Dr. Swamidass has done in his book is to attempt to address these concerns by preserving the Adam and Eve narrative while finding a way to harmonize it with our current understanding of human genetic diversity and natural history.

Being a biologist who is also a Christian and who has been a public advocate for evolution, I am sympathetic to Dr. Swamidass' efforts. As the co-author of widely used secondary school biology textbooks³, I have testified in two federal trials regarding the teaching of evolution⁴, and seen first-hand the way in which the desire to defend the Genesis narrative motivates passionate opposition to science education. If a reconsideration of the story of Adam and Eve could resolve such issues and bring peace to the "evolution wars," I would be all for it.

Genetic ancestry vs. Genealogical ancestry

Kudos first. Dr. Swamidass begins by making an important distinction between genetic ancestry and genealogical ancestry. This distinction

1. S. Joshua Swamidass. *The Genealogical Adam and Eve: The Surprising Science of Universal Ancestry*. InterVarsity Press, 2019.

2. Bobby Ross Jr. *If Christians don't believe in a literal Genesis, they have no foundation for their doctrine*. The Christian Chronicle. March 20, 2018.

3. *Biology by Miller & Levine* © 2019, Savvas Learning Company.

4. These were: *Selman v. Cobb County School District*, 2005; and *Kitzmiller v. Dover Area School District*, 2005.

is at the very heart of the scientific argument he wishes to make. For example, while I have just two parents, I had four grandparents, eight great-grandparents, and sixteen great-great-grandparents. What this means is that as we go backwards in time, we find ourselves related by descent to more and more people. We might, for example, discover a famous couple, such as John and Abigail Adams, in our family tree, placing them among our genealogical ancestors. That would not mean, however, that all our genetic information was derived solely from John and Abigail. In that respect, they would not be our only genetic ancestors. This has important implications for how we might regard Adam and Eve as progenitors of humankind.

To explain, let's consider the hypothesis that there were two individuals living 6,000 years ago that appear in our family tree today. If roughly 300 human generations have passed since then, in principle, how many individuals might have descended from them over that time? The answer is 2×10^{90} , which is a large number far larger than the current population of the Earth⁵. So, the notion that literally everyone on Earth could be, by genealogical descent, related to two people who lived only 6,000 years ago, is scientifically valid. So, in that limited sense, we could indeed all be the children of that first couple.

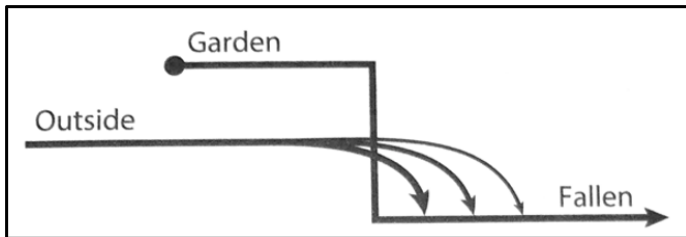
This calculation is at the heart of Dr. Swamidass' attempt to reinstate Adam and Eve as the genealogical parents of all humans living today. However, there is an important genetic point to be made before we declare the Biblical story to be plausible. Even an individual who is only a 10th generation descendant of one of their ancestors would carry just 1/2 to the 10th power or about 1/1000th of the genetic information of that ancestor. Therefore, someone who might be your genealogical ancestor several thousands of generations removed would, in effect, be nothing more than a "genetic ghost," in Dr. Swamidass' terminology, with respect to their contribution to your own genome today.

Descendants of the sacred and the profane

The distinction between genetic and genealogical ancestors is at the heart of the Swamidass solution to harmonize science and faith. In his view, we may imagine that there were two divinely created humans in the Garden prior to their expulsion. Outside the Garden, there was a population of humans produced by the ordinary process of biological evolution. When our parents were expelled from the Garden of Eden they took residence among the rest of humanity, and

5. This calculation assumes a generation time of 20 years, and that each mating couple would have produced two children, each of whom would then have produced two children of their own, and so forth.

it is from this combined population that we are descended. In essence, humans today are related by genetic and genealogical descent to both the sacred and the profane. This diagram from his book summarizes the idea very clearly:



Dual Origins: This diagram from *The Genealogical Adam and Eve* illustrates how a single, Divinely created couple would have been forced to join a pre-existing, evolved human population outside of the Garden after the Fall.

At a stroke, this would seem to resolve the conflict between Scripture and science. Yes, the Adam and Eve story is true. There was an Eden, there was a Fall from grace, and there was an expulsion. Yet nonetheless the evolutionary narrative of human evolution is also true. We are an evolved species, and we can trace the vast majority of our genetic ancestry to those outside the garden. This accounts not only for the pre-human fossil record, but also for the genetic kinship we share with other creatures, most notably the great apes.



Human Ancestry: The Swamidass hypothesis embraces both the Sacred and the Profane. It requires that Adam and Eve lived within a Divinely created Eden surrounded by a world inhabited by an evolved human population. Paintings by [Johann Wenzel Peter \(1745\)](#) and [John Sibbick \(2010\)](#)

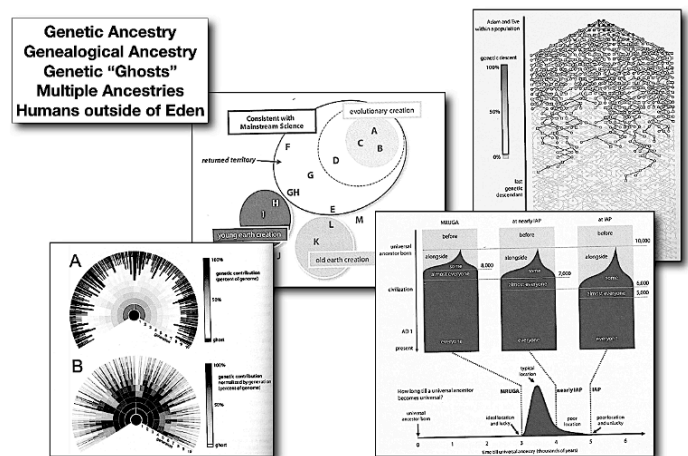
While I am certainly not a Bible scholar, I certainly find absolutely nothing in the Scripture that would argue definitively against this thesis. Admittedly, I don't find much in Scripture that supports it either. As a scientist, I can say that the argument that Dr. Swamidass makes with respect to genealogical as opposed to genetic ancestry is perfectly valid. He is to be lauded for the creativity of his argument and for the attempt he has made to harmonize science and faith by proposing a mixed ancestry for modern humans.

However, there at least four problems with the argument. It is needlessly complex, it will not satisfy Biblical creationists, it ignores the Genesis narrative of natural history, and, above all, it is theologically unnecessary.

Difficulties of the argument

First, we should understand that the creative formulation proposed by Dr. Swamidass is dauntingly complex. Multiple illustrations in his book attempt to highlight the distinctions between genealogical and

genetic ancestry, the concept of genetic ghosts, the importance of multiple lines of descent, and the relationship between a pair of Divinely created humans and the evolved population of *Homo sapiens* living outside the Garden.



Complexity: Scientific details of the Genetic/Genealogical argument for human origins are highly complex and require an understanding of multiple aspects of population genetics in order to merge the Biblical account with the evidence for human evolution. Diagrams from *The Genealogical Adam and Eve*.

On one level, he has done a remarkable job of making his arguments clear to professional scientists. Frankly, however, to understand them would require considerable effort on the part of a reader not trained in population genetics or lineage tracing. This is a serious issue for any idea that might hope to move into the religious mainstream in a way that would solve the continuing conflict between faith and evolutionary science. By contrast, the two competing ideas, direct genetic descent from a first couple or evolution of *Homo sapiens* from pre-human primates, are both simpler, less complex, and far easier to grasp. A merger between the two, which is essentially what he proposes, would require a level of mental gymnastics unlikely to appeal to those who are already satisfied with their current views on human origins.

Dr. Swamidass is fully aware of the profound conflicts that Biblical creationists encounter when they are asked to cope with the wealth of evidence, fossil, genetic, and genomic, for the evolutionary origin of the human species. Since they have attempted to deal with this by a wholesale rejection of the evidence for human evolution, it should be clear that his formulation, which accepts exactly such evidence, is most unlikely to attract support from fundamentalist circles. Today's creationists will not accept any element of non-human ancestry as part of the history of our species, and I see no way around this problem. As a result, nothing in Dr. Swamidass' complex hypothesis of dual origins is likely to appeal to those in the literalist camp. It simply will not resolve the conflict.

On a personal level, I have been involved in struggles with modern Biblical creationists for more than four decades and hasten to point out that his formulation is not going to satisfy the very substantial anti-evolution movement in the United States today. To them, any challenge to the fixed nature of created "kinds," any suggestion that human evolution might be subject to the "random" nature of the evolutionary process, and any hint that our lineage includes a sibling relationship with other species is to be rejected out of hand. The

ingenious solution provided by Dr. Swamidass will not move them from denial to acceptance – of that I am certain.

Any attempt to confirm universal ancestry from a Biblical first couple also presents a profound scientific problem. In its effort to say that the Adam and Eve story is correct, it ignores the obviously false Genesis narrative of natural history in which the Adam and Eve story is deeply embedded. We must remember that the Genesis story involves more than just Adam and Eve. It is a step-by-step recounting of creation events that attempts to account for the first appearance of virtually every living creature during a six-day creation week.

As Genesis 1 describes that week, first light is created, then day and night, and then dry land followed by plants and trees. Curiously, the sun, which clearly predated the first appearance of life on Earth, does not appear until later. Nonetheless, plants were apparently flourishing despite the absence of the sun. On the fifth day, swimming creatures, including great whales, were created. Land animals did not appear until the sixth day, even though the fossil record shows very clearly that land animals were present for hundreds of millions of years before the very first whales appeared in the seas. Flying creatures, “winged fowl,” also appear on the fifth day, even though the fossil record clearly shows that land creatures preceded them.

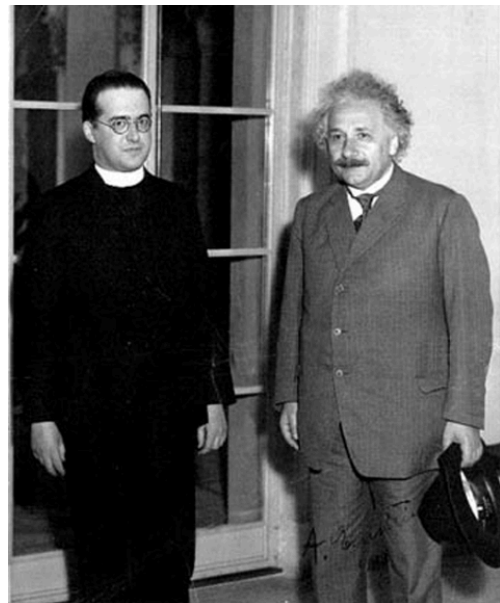
These are just some of the ways in which the Biblical account is contradicted by natural history, something that even John Calvin recognized in his Commentary on Genesis ⁶. Calvin noted that while Genesis describes the creation of two “great lights,” the lesser of which would “rule the night,” astronomy had shown that this was not quite correct. He wrote: “Moses [the presumed author of Genesis] makes two great luminaries; but astronomers prove, by conclusive reasons that the star of Saturn, which on account of its great distance, appears the least of all, is greater than the moon.” How could this scientific error have found its way into the word of God? Calvin’s explanation was that Moses wrote in a “popular style” so that “ordinary persons” would be able to understand. Why did he do this? Because, according to Calvin, a scientifically accurate account would have been beyond the capacity of the intended audience: “Had he spoken of things generally unknown, the uneducated might have pleaded in excuse that such subjects were beyond their capacity.” ⁷ In other words, not even John Calvin required that the Genesis account be scientifically accurate.

These are just a few of the many claims and statements in Genesis that are clearly contradicted by science. If we construct a highly speculative dual ancestry narrative to rescue just one element of the Genesis story, namely the creation of a first couple in the Garden, we are still left with a false narrative of natural history that is completely at odds with science. If it is so important to find a way to allow for the historicity of Adam and Eve, what comes next? Must we bend time and space to accommodate a collection of pre-scientific origin stories that extend far beyond a first couple to account for the origins of an earth-centered universe and the special creation of every living thing? This, to his credit, is not a bridge that Dr. Swamidass is willing to cross. But others surely have and will do so in the future, encouraged by his genealogical reasoning.

Finally, while I regard Dr. Swamidass’ work as a well-meaning and even heroic effort to harmonize Scripture with science, it is simply not necessary in a theological sense. Scripture was written in a pre-scientific age, something that many scientists who were also people of faith have recognized and come to grips with. One example is the Belgian priest and theoretical physicist Georges Lemaître. In a 1927 paper based on astronomical observations and general relativity, Lemaître was the first to propose an expanding universe, a concept later reinforced by the observations of Edwin Hubble.

The “Big Bang,” as this concept came to be known, was clearly at odds with the Genesis account of creation. Lemaître, who remained a priest throughout his life, was frequently asked about the fact that the Big Bang and the expanding universe don’t seem to appear in Genesis. In response he said, “the writers of the Bible were illuminated on the question of salvation. But on other questions, they were just as wise or ignorant as those of their generation. Hence, it is utterly unimportant if errors of historic and scientific fact are found in the Bible, especially if those errors relate to events that were not directly observed by those who wrote about them.” ⁸ I think it is safe to say that the author or authors of Genesis were not there to observe the creation of the universe, and that was Lemaître’s point. His faith in Scripture was in its spiritual message, not in its ability to predict the findings of scientific disciplines that would not come into existence until centuries later.

A similar sentiment was voiced by Theodosius Dobzhansky, whom many regard as the greatest evolutionary geneticist of the 20th century. In 1973 Dobzhansky wrote a remarkable article for the *American Biology Teacher* on the importance of teaching evolution in public schools ⁹. The title of that article, “Nothing in Biology Makes



Georges Lemaître: With Albert Einstein after Lemaître’s lecture at the California Institute of Technology in 1933.

6. Calvin, John. Commentaries On the First Book of Moses Called Genesis. Translated by John King. Vol. 1. Grand Rapids: Wm. B. Eerdmans Publishing Company, 1948.

7. John Calvin. Commentary on Genesis – I. <https://www.ccel.org/ccel/calvin/calcom01.vii.i.html>

8. The Literary Digest, 1933. As quoted in *The Day Without Yesterday* by John Farrell, p. 203.

9. Theodosius Dobzhansky. Nothing in Biology Makes Sense Except in the Light of Evolution. *The American Biology Teacher* (1973) 35 (3): 125–129. <https://doi.org/10.2307/4444260>

Sense Except in the Light of Evolution” has been quoted so frequently that many have overlooked the article itself. Dobzhansky, himself a Christian, felt obliged to address the apparent conflict between the creation story in Genesis and our modern understanding of the evolutionary process. He put it this way: “The organic diversity of life becomes, however, reasonable and understandable if the Creator made the living world not by caprice, but by evolution propelled by natural selection.” He then wrote, “it is wrong to hold creation and evolution as mutually exclusive. I am a creationist and an evolutionist.” According to Dobzhansky, “evolution is God’s, or Nature’s method of creation. Creation is not an event that happened in 4004 BC; it is a process that began some 10 billion years ago and is still underway today.”

Dobzhansky embraced the notion of a continuing creation and saw the process of evolution as the mechanism by which the living world

came into existence according to the will of God. His formulation, which respects both faith and science, clearly demonstrates how the spiritual and moral lessons of Scripture can be accepted within a scientific worldview. Dobzhansky and Lemaître did not find it necessary to construct elaborate schemes that might contort their scientific findings to match the specific language of Genesis. Their confidence in the validity of science itself emerged from faith in human reason, which they saw as a gift from God, and which they applied passionately to their work of understanding the natural world. We should do the same with respect to human origins, to follow the evidence where it leads, and to reject unnecessary excursions intended to match the language written in a pre-scientific age. The Swamidass solution is both clever and bold, but it will do little to placate the Biblical critics of science and may even embolden them.

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