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ADAM AND EVE:

Fact or Fiction?



When Did God Create Adam and Eve?

- Dr. Hugh Ross

No matter where I speak in the world, people in my audiences press me for a precise date for God creating the first human beings, Adam and Eve. Seeing how disappointed they are when I tell them that neither the Bible nor science offers an exact date gives me some understanding of why Archbishop James Ussher and Reverend John Lightfoot felt compelled to calculate, to the day and the hour, the timing of God's creation of Adam and Eve.

Best Biblical Dates for Adam and Eve

Using the numbers associated with the genealogies in Genesis, Exodus, Kings, and Chronicles, Ussher and Lightfoot determined that Adam was created on October 23 at 9 AM, 45th meridian time, in 4004 BC. Their determination presumed that these genealogies were exhaustive—with no generations missing. A wealth of biblical scholarship proves otherwise.¹

Though the biblical genealogies offer little help in establishing Adam's creation date, three other biblical clues do. First, Genesis 10:25 states that the world was divided in the time of Peleg. Given the context of God scattering humanity over the whole face of Earth, this statement probably refers to the time when the Bering Land Bridge became the Bering Strait. Reliable carbon-14 dating places this event at 11,000 years ago. This date implies that the worldwide scattering of humanity must have predated 9000 BC and that Noah's flood must've

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occurred before 9000 BC. The creation of Adam would have occurred much earlier yet.

Second, Genesis 2 describes four known rivers flowing out from named locations—in the mountains of Arabia and the mountains surrounding Mesopotamia—and meeting together in the Garden of Eden. (Adam was placed in Eden shortly after he was created, and Eve was created in Eden.) The only time these rivers can join together on dry land is when most of the Persian Gulf is dry.² The drying up of most of the Persian Gulf requires that Earth be in an ice age. The last ice age persisted from 120,000 to 13,000 years ago and the ice age before that from 230,000 to 135,000 years ago.

Third, the earliest archaeological evidence for human activity appears in both the Persian Gulf region and in east and southern Africa. This evidence implies an easy migration route between the Persian Gulf region and east and southern Africa. This route took the form of lush growth along the Gihon River through southern Arabia and a land bridge connecting the southwestern part of Arabia to the Horn of Africa. Such a migration route existed three times during the last two ice ages: 55,000, 75,000–130,000, and 150,000–160,000 years ago.³ It was most favorable for human migration during the first two of the three epochs.

The most likely biblical date for the creation of Adam and Eve, therefore, would lie between 55,000 and 120,000 years ago. However, the date could be stretched as far back as 230,000 years ago.

Best Scientific Dates for Adam and Eve

The earliest undisputed evidence for human industry comes from carbon-14 dates establishing that humans used tools to grind roasted grains into flour at least as long as 32,614 ± 425 years ago.⁴ The earliest undisputed evidence for symbolic expression and advanced art dates back to 36,000 years ago.⁵ The earliest undisputed evidence for rapidly advancing tool technology and the manufacture and use of clothing and jewelry dates back to 40,000–45,000 years ago. Thermal and optical luminescence dating techniques indicate that jewelry and art pigments were being used by humans 70,000–80,000 years ago and even as far back as 165,000 years ago.⁶ However, thermal and optical luminescence dating can only be trusted to yield upper limits—that is, the dates could indicate more recent times.

The latest genetic dates for mitochondrial Eve range from 107,000 to 197,000 years ago.⁷ The latest genetic dates for Y-chromosomal Adam range from 101,000 to 200,000 years ago.⁸ The reason these genetic dates are in such discord is that they presume different molecular clock rates. Molecular clocks, however, are notoriously unreliable timekeepers.⁹

The best available science places the origin of humanity previous to 45,000 years ago. However, scientifically, the origin of human beings could date as early as 200,000 years ago.

The uncertainties in both the biblical and scientific dates are numerous. Furthermore, it's unlikely that future biblical and scientific research efforts will ever reduce the uncertainties.

Fundamental barriers prevent us from achieving significantly better dates. However, what's most encouraging for the Christian faith is that the biblical and scientific dates agree.

Endnotes

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Were They Real? The Scientific Case for Adam and Eve

- Dr. Fazale Rana

Did Adam and Eve really exist? Did all humanity originate from a single pair? These questions aren't peripheral topics for an academic debate; they're central to the Christian faith.

Toward this end, recent advances in molecular genetics are quite provocative. As Hugh Ross and I discuss in *Who Was Adam?*, numerous studies indicate that humanity originated: (1) recently (around 150,000 years ago, plus or minus 20,000 years or so); (2) at a single location (East Africa)—close to where some Bible scholars think the Garden of Eden was located; and (3) from a small population of individuals.

Moreover, analysis of mitochondrial DNA (which provides insight into the origin of the maternal lineage) indicates that humanity traces back to a single ancestral sequence that could be interpreted as a single woman. Likewise, characterization of Y-chromosomal DNA (which provides insight into the origin of the paternal lineage) indicates that all men trace their origin back to a single ancestral sequence that could be interpreted as a single man. Studies published in 2013 indicate that the dates for mitochondrial Eve and Y-chromosomal Adam closely coincide with each other.¹ Analyzing Y chromosome sequences recovered from men around the world,

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two independent research teams concluded that the last ancestor of all men lived between 120,000 to 156,000 years ago and 180,000 to 200,000 years ago, respectively. One team also concluded that the ancestor of all females lived between 99,000 and 148,000 years ago.

These astounding results harmonize with a traditional reading of the biblical account of human origins. The scientific data suggests that Adam and Eve likely existed as real persons who gave rise to all of humanity.

But Did Adam and Eve Exist?

Others have challenged this interpretation that a single couple produced all humanity, arguing that the genetic data shows that modern humans arose from thousands of individuals, not two.² Many evolutionary biologists reject the notion that mitochondrial Eve and Y-chromosomal Adam were the original biblical couple. Instead, they argue that human beings originated as a population and that, accordingly, there were many "Eves" and "Adams." In other words, they assert that we descended from the two who were lucky enough for their genetic material to persist to the present. The genetic lines of the other first humans were lost over time.

The chief basis for this claim comes from estimates of the ancestral population size of humans based on genetic diversity.

It's possible to estimate the effective population size of any ancestral group from genetic diversity of present-day populations if the mutation rate is known. As discussed in *Who Was Adam?*, a number of these types of studies do indeed indicate that humans stem from a small population, on the order of a few hundred to a few thousand.³

Skeptics of the traditional reading of the biblical account of human origins accept these results. They argue that the data indicate humanity experienced a genetic bottleneck, with the population collapsing to a relatively small number of individuals. Consequently, humanity arose from the thousands of survivors, not a primeval pair.

Critics also point to other methods to model the ancestral population size that don't depend on mutations but on other types of processes to generate genetic diversity.⁴ Studies employing these methods also seem to indicate that humanity arose from population sizes on the order of a few *thousand* individuals.

What Was the Population Size, Really?

In the face of this challenge, it's important to recognize that population sizes generated by these methods are merely estimates, not hard and fast values. The reason: the mathematical models are highly idealized, generating differing estimates based on a number of factors. As a case in point, consider two studies: One examined DNA sequence elements called short tandem repeats at 377 locations in the human genome for 1,056 individuals who represented 52 population groups.⁴ On the basis of this analysis, they concluded that humanity originated

from a single point of origin (apparently Africa), from a small population (62,000 or fewer) between 71,000 and 142,000 years ago.⁵ Although this conclusion was consistent with that of an earlier (second) study of short tandem repeats, the population size estimate from the earlier study was around 500 individuals.⁶ The reason for the difference (of about 1,500) was due to a varying sample size and the number of locations in the human genome that were studied.

Did humanity originate from a single pair? Even though population estimates reveal that humanity originated from several hundred to several thousand individuals based on mathematical models, it could well be the case that these models overestimate the original numbers for the first humans.

Are Population Size Methods Valid?

Another concern relates to the validation of the methods used to estimate the original population size of humanity. Researchers assess the soundness of scientific methods through a process called method validation. A key part of this process involves applying the method to "known" samples. If the method produces the expected result, it passes the test.

So, are the methods used to estimate population sizes valid? These methods appear to be based on sound, well-understood phenomena, and therefore should be considered reliable. But that's not enough. Scientific methods can only be considered reliable if they've been validated.

As it turns out, studies in conservation biology raise serious questions about the validity of these methods. Of course, we can't directly validate methods designed to measure the numbers of the first humans because we don't have access to that initial population. But we can gain insight into the validity of these methods by turning to work in conservation biology. When a species is on the verge of extinction, conservationists often know the numbers of species that remain. And because genetic variability is critical for their recovery and survival, conservation biologists monitor genetic diversity of endangered species. In other words, conservation biologists have the means to validate population size methods that rely on genetic diversity.

Several studies (involving mouflon sheep, Przewalski's horses, white-tailed deer, white-tailed eagles, copper redhorse [fish], and gray whales) in which the initial populations were known yielded unexpected results toward this end. When the researchers measured the genetic diversity generations after the initial populations were established, the genetic diversity was much greater than expected—again, based on the models relating genetic diversity and population size.⁷ In other words, the population size methods failed validation in each of these cases. If researchers used the genetic variability to estimate original population sizes, the sizes would have measured larger than they actually were.

A study published in 2012 by researchers from Finland illustrates this problem. These scientists monitored the genetic diversity (focusing on 14 locations in the genome consisting of microsatellite DNA) of a population of white-tailed deer that were introduced into Finland from

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North America in 1934. The initial population consisted of three females and one male, and since then has grown to between 40,000 to 50,000 individuals. This population has remained isolated from all other deer populations since its introduction.

Though the researchers found that the genetic diversity of this population was lower than for a comparable population in Oklahoma (reflecting the genetic bottleneck that occurred when the original members of the population were relocated), it was still surprisingly high. Because of this unexpected high genetic diversity, size estimates for the initial population would be much greater than four individuals. To put it another way, this population size method fails validation.

One explanation for this discrepancy appears to be long generation times. That is, animals with long generation times display greater-than-anticipated genetic diversity, even when the population begins with a limited number of individuals.⁸

Consequently, if these same models were used to estimate the effective sizes of the ancestral population of humanity from the measured genetic diversity at any point in time, they would've overestimated the original population size as much larger than two individuals.

It's important to note that an origin of humanity from a small population comports with the existence of a historical Adam and Eve who gave rise to all of humanity. After their creation the biblical text teaches that they procreated—having many sons and daughters (Genesis 5:4). Given the limitations of the methods to estimate population size, could it be that the population estimates are reporting on the population structure of humans sometime after their creation when the population would've been small, on the order of a few thousand?

Additionally, skeptics who claim that humanity came from thousands of individuals (not two) assume that Adam and Eve were genetically identical. Yet, there's no hint of that idea in Scripture. When Eve is created, God takes material from Adam's side and *rebuilds* (*bānâ* in the original Hebrew) it. Part of this process could've involved the introduction of genetic differences into Eve's genome that made Adam and Eve genetically heterogeneous.

So, were Adam and Eve real?

Despite the claims to the contrary, nothing from science rules out their existence. In fact, the discovery of mitochondrial Eve and Y-chromosomal Adam is provocative and gives credence to the idea that a couple was the sole progenitor of all humanity, just like Scripture teaches.

Endnotes

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