



# FiRST Principles

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Reason  
Science  
Technology

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## Opening Message

I hope that all our readers have had a wonderful Spring. I write the introduction to this issue of *FiRST Principles* on Holy Saturday, anticipating the joy of Easter. The Easter celebration seems particularly relevant to the content of this journal issue, which is focused on the scientific and theological questions surrounding the existence and biological evolution of human beings through time.

A particularly interesting – and emotionally charged – goal is reconciling the truths of humanity’s beginning, as revealed in the book of Genesis, with scientific evidence and theories. This is not merely a task for understanding human nature and development, but it also bears on a crucial understanding of the first man and woman. The theological development linking Adam and Eve with Christ and his Church implicates the divinely created nature of humanity as well as the fundamental basis for human dignity. It is, in fact, a major tradition in Catholic theology to describe Christ as the New Adam, as declared in the Pastoral Constitution of the Second Vatican Council, *Gaudium et Spes* (n. 22):

“The truth is that only in the mystery of the incarnate Word does the mystery of man take on light. For Adam, the first man, was a figure of Him Who was to come, namely Christ the Lord. Christ, the final Adam, by the revelation of the mystery of the Father and His love, fully reveals man to man himself and makes his supreme calling clear.”

What is the proper role for science in all this? There are many ways to approach such study. In this journal issue, Dr. Dennis Bonnette states that “It was never the intent of this paper to offer scientific proof of Adam and Eve’s literal reality. The sole purpose has been to show that they are *not scientifically impossible*.” In his own article, Steven Green argues that “The scientists’ aim is to catalog, report, examine, and test the evidence to develop a plausible explanation. This explanation is not, and must not, be considered fact, but rather scientific theory.”

The key is to conduct scientific exploration with a mindset that respects the guidance and authority of faith. In his Member Spotlight essay, Dr. Dan Finucane shares that “I find in many students an almost audible sigh of relief in their reflection papers and conversations, when they understand that they do not have to choose between the pew and the lab bench.”

In this Easter (or Paschal) Season, as we celebrate the historical completion and ongoing renewal of Christ’s revelation to the descendants of Adam and Eve, I am grateful to the authors who have generously shared their thoughts with the ITEST community and broader readership.

I pray that we will all be better for it.

Christopher Reilly, Th.D.  
Editor, *FiRST Principles*

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## Announcements

### ITEST Webinars


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Apr 18 2026	The New Genetic Medicine: Miraculous Cures, Ethically Challenging Advances, or Both?	Fr. Kevin FitzGerald, S.J., Ph.D., Ph.D. Fr. Dennis Billy, C.Ss.R.	<a href="https://faithscience.org/the-new-genetic-medicine/">https://faithscience.org/the-new-genetic-medicine/</a>

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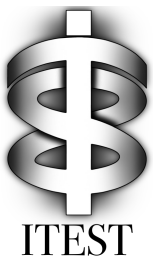
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New Book	<b>The Marian Dimension in the Apocalypse of St. John</b> by Frits Albers, edited by Frank Calneggia
	<p>This present work on Our Blessed Lady, <i>The Marian Dimension in the Apocalypse of St. John</i>, brings to maturity the consoling doctrine: ‘that only One Church was created by God in the Image and Likeness of His Mother’. Mary is ‘the Woman of Genesis’ who, in the Incarnation, produced the Seed to Whom total victory over evil was promised. In founding a Church, Christ extended Mary’s offspring which would share in His battle as well as in His victory. Spanning a history of two thousand years, the author shows with accomplished skill that during that time span only one Church retained the glorious title of being totally Marian.</p> <p>Find this book at <a href="https://enroutebooksandmedia.com/mariandimension/">https://enroutebooksandmedia.com/mariandimension/</a>.</p>

<b>In Memoriam</b>
<p>We ask your prayers for this ITEST member who recently died and entered Eternal Life.</p> <p><b>Sister M. Rita Matiku, IHSA</b>      <b>2022</b></p> <p><b>Anthony C. Eirich</b>                      <b>06/12/2023</b></p> <p><b>Randy Pagnotta</b>                        <b>10/16/2025</b></p> <p>We ask your prayers for ITEST members who are ill. May they feel the restoring hand of the Lord.</p>

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Institute for Theological Encounter with Science and Technology  
 Cardinal Rigali Center • 20 Archbishop May Drive • St. Louis, Missouri 63119 • USA  
 314.792.7220 • [www.faimscience.org](http://www.faimscience.org) • E-mail: [ITEST@archstl.org](mailto:ITEST@archstl.org)

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 Sister Marianne Postiglione, RSM, Senior Editor • Sheila Roth, Managing Editor  
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## ITEST Member Spotlight

Dan Finucane, Ph.D.

On my last day as an undergraduate, I sat in a grassy quad under the spring sun and heard a commencement speaker offer a vision for interdisciplinary education. “The biologist should be talking to the psychologist. The business expert should be talking to the chemist. The art historian should be talking to the mathematician.” I thought – “Where was this message for the last four years?”

As a math major, my favorite course had been “Art and Civilization” - two semesters of a professor putting works of art on the screen, and asking, “What does this work say about what it means to be human?” (An upper-level course in advanced calculus came in second in the favorites list.)

There were certainly instincts in many professors and students and course commitments that crossed specialties and invited big questions and collaboration. But the ethos of the campus was to dig in and master a particular area. Do research. Succeed? Zero in and master the trail.

Later graduate work in theology, a decade as a Campus Minister at Saint Louis University, and eventually the chance to teach full time in the Department of Theology Studies at SLU have given me the opportunity and the great grace to ask my students to think of connections between areas of study, especially between faith and reason, and most excitedly, the relationship of science and religion.

I find in many students an almost audible sigh of relief in their reflection papers and conversations, when they understand that they do not have to choose between the pew and the lab bench. (If pressed on this, many will choose the lab.) A lot of voices in our culture tell them they cannot have both commitments. I introduce them to the cottage industry of authors and programs where robust study and interactions are taking place, to support and nurture their faith-based worldview and their commitment to science. Teaching historical foundations for key issues helps them see what was actually at stake in the Galileo case and in Darwin’s impact. I invite them to see the foundations that believers in God offered for the rise of science in the west. I invite them to overcome clichés and assumptions and ask the real questions they have. In this sort of work, we can show our students that



sophisticated questions and challenges can be handled in an informed, deep way. Myths can be debunked. We can show that a nuanced way of reading scripture, with awareness of its historical context, and its power to invite the understanding that the living God is involved in creation and history with strength and truth and mercy, is a deep part of our tradition.

Along the way, key professors in undergraduate and graduate studies have supported me, as my colleagues do now. And some invited me to join ITEST. Charles Ford, the mathematician whom I knew on two campuses and remained friends with, invited me to get involved. I had several chances to meet Fr. Bob Brungs, S.J. and be drawn by his invitation and work. I owe much to the example and energy of Sr. Marianne Postiglione, RSM and Sr. Carla Mae Streeter, OP. Being part of a Jesuit university has deeply nurtured the approach to science and religion that allows me to work and think and teach.

I have a one-minute reflection I offer my students. As they are tempted or goaded to think that faith and science do not get along, I put a picture on the screen of SLU’s hospital on South Grand. “Ever heard of something called a ‘Catholic hospital?’” (They have.) What do you figure goes on in there? Dancing around the bed, chanting? Burning of incense? Actually, I was in the place, and it was full of MRI machines, scientists, pharmacy resources, labs ... and a chapel. There are people who go into both the faith and science spots. So why do people think they have to choose one over the other?

I am privileged to be part of vital conversations as my students prepare for their own future work.

Now for a true confession. I am a lousy ITEST member when it comes to showing up at things. I haven’t been to a conference for a while. But I am deeply enriched by membership and its resources and support. I find ITEST’s publications vital. The connections I still have with members help me know that the *Ekklesia* is wide and committed to exciting study and witness.

I find that all of my own questions, struggles, study, and ongoing conversations have given me a vocation. ■

## The Scientific Possibility of Adam and Eve<sup>1</sup>

By Dennis Bonnette, Ph.D.

From [\*The Postil\*](#) (March 1, 2025)

Until the advent of Darwinian evolution, most Christians believed that the entire human race actually descended from our literally-real first parents, Adam and Eve. Many still do. In 1950, Pope Pius XII issued an encyclical, *Humani Generis*, in which he wrote that “revealed truth and . . . the *magisterium* of the Church teach” that Original Sin is “a sin truly committed by one Adam [*ab uno Adamo*], and which is transmitted to all by generation, and exists in each one as his own.”<sup>2</sup> The current *Catechism of the Catholic Church: Second Edition* tells us that “Adam and Eve committed a *personal sin*” . . . “which will be transmitted by propagation to all mankind. . . .”<sup>3</sup>

... this account of our literal first parents and Original Sin, which is the essential rationale for the need of Christ as a Redeemer, has been challenged by modern scientific claims ...

Still, this account of our literal first parents and Original Sin, which is the essential rationale for the need of Christ as a Redeemer, has been challenged by modern scientific claims on two fronts: (1) the Christian belief that true man suddenly appeared in the form of Adam has been replaced with the standard theory of human evolution in which progressive changes in early primates evolved the consciousness and intelligence of modern man, with no clear line of demarcation marking his initial appearance, and (2) the claim that our human species arose from a single pair of first parents has been replaced with evolution taking place in large populations whose number never saw a bottleneck (reduced population) of just two individuals.

The former claim arises largely from the evidence of paleoanthropology, revealed in the gradual, progressive development of tools over time, and the latter arose particularly from the work of geneticist Francisco Ayala, whose often-cited mid-1990s studies maintained that the human population never was fewer than several thousand individuals.

### Instant Appearance of the First True Human Beings

Paleontology discovers progressive improvement in tools made by evolving primates, which seems to correlate with development of hominin brains and anatomy. (Hominin is a term that includes recent humans together with extinct ancestral and related forms.) This sequence finally blends into the sophisticated tool-making and other abilities of modern man. Yet, there appear to be no sudden signs of a “spiritual-souled” Adam. Neo-Darwinists infer that all this improvement can be explained in naturalistic terms. Yet, what these facile materialist scenarios overlook is the fact that the rational case for man’s essential superiority over brute animals remains robust.<sup>4</sup> Christian philosophy argues that true man is marked by intellectual activities of understanding, judging, reasoning, and free will that manifest the spiritual soul’s presence.<sup>5</sup>

Complex sentient behaviors of irrational animals enabled early primates to produce primitive stone tools, even including early Acheulean stone hand-axes exhibiting some symmetry—wrought by *Homo erectus* hominins dating back 1.4 million years. Still, it wasn’t until the early Middle Pleistocene period, some three-quarters of a million years ago, that later hand-axes appeared having a congruent, three-dimensionally symmetrical shape that apodictically demonstrates true human intellection.<sup>6</sup> This, as well as evidence of early controlled use of fire, appears about that time—*evincing the first unequivocal presence of the human spiritual soul*. These sophisticated artifacts may be viewed as scientific evidence, which also has an important philosophical implication, namely, that such artifacts necessarily imply the activity of an intellectual agent—a qualitatively superior, true human being with a spiritual soul.<sup>7</sup> True man may have been present earlier, but remains thus far undetected.

Since mere matter can never evolve into spirit, *true man must have appeared instantly at some point*—regardless of the *misreading* of fossil tool evidence by Neo-Darwinians. Scientific failure to detect that fact and that moment in no way undermines the philosophical necessity of its reality. The scientific possibility of a literal Adam and Eve remains intact de-

*Continues on page 5*

spite the gradual improvement of toolmaking. Moreover, the philosophical proof that there *must be* a first true human being lends support to the credibility of Adam and Eve, since having a *spiritual-souled first true man is part of that biblical account.*

**The Challenge Posed by Modern Genetics**

Until very recently, it has been accepted scientific dogma that human beings could not have arisen from a *single mating pair* of first true humans. This claim has been based on the distribution of single nucleotide polymorphisms in the human population, and coalescence and lineage disequilibrium studies. Researchers have estimated the hominin population at the time of our origin had to be in the thousands. Indeed, some researchers claim that there has never been a hominin population smaller than one thousand in the last two million years.<sup>8</sup>

Yet these estimates are subject to confounding error because of the assumptions involved, for example, “...a *constant background mutation rate* over time, *lack of selection* for genetic change on the DNA sequences being studied, *random breeding* among individuals, *no migrations* in or out of the breeding population, and the assumption of a *constant population size*,”<sup>9</sup> such that DNA sequence differences (polymorphisms) alone are insufficient to determine effective population size.<sup>10</sup>

Perhaps the best example of such a failure is the study by geneticist Francisco Ayala published in *Science* (1995),<sup>11</sup> in which he claimed that a mating pair of just two first true humans was scientifically impossible. Ayala based his claim on the large number of versions (alleles) of the gene HLA-DRB1 that are found in the present human population. Ayala claimed that there were thirty-two ancient lineages of HLA-DRB1 prior to the *Homo* (human)/*Pan* (chimpanzee) split, which he said occurred six million years ago. The problem is that each individual carries only two versions of a gene—so that there would be no way that just two individuals could have possibly passed on all those alleles at any time since the lineages split. A bottleneck (reduced population) of just two true human beings, Adam and Eve, appeared to be *scientifically impossible.*

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But it turned out that Ayala’s claim of thirty-two ancient HLA-DRB1 lineages contained methodological errors. The DNA he chose was subject to strong selection, hypermutation, and gene conversion, which skewed his results. Recognizing the problem, Tomas Bergström et al. published a study (1998) showing just seven such alleles at the time of the *Homo/Pan* split, with most of the present genetic diversity appearing in the last quarter million years.<sup>12</sup> Still later, another study (2007) by von Salomé et al., inferred that only four such lineages existed more than five million years ago, with a few more appearing shortly thereafter.<sup>13</sup>

While this article is too short to analyze all the genetics pertinent to these studies, often overlooked is the inherent epistemic weakness of these retrospective calculations. It is all too easy to make false assumptions that invalidate results. The assumptions of random breeding among individuals, constant mutation rates, or constant population size may be incorrect. Even the methods used for analysis can make a difference. One need merely think of the errors already noted in present day computer models about trends of climate change.

Indeed, claims that “Adam and Eve are scientifically impossible,” are not scientific, as science is always subject to revision, as we shall see.

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**The Proposed “Interbreeding Solution”**

Given the seemingly problematic genetics of a literal Adam and Eve, philosopher Kenneth W. Kemp, writing in the *American Catholic Philosophical Quarterly* (2011),<sup>14</sup> proposed an alternative solution in the form of the interbreeding hypothesis, that is, that present genetic diversity in genes, such as HLA-DRB1, might be explained through interbreeding between Adam and Eve’s true human descendants and their subhuman “relatives” in the same biological population.

Kemp’s hypothesis meets the theological requirements that Adam and Eve must be the first true human beings and that all true humans today must be

*Continues on page 6*

their biological descendants. In any such scenario, the possession of intellect by true men would enable them to outcompete their subhuman “cousins,” thus explaining why such nearly identical subhumans are no longer extant.

Given that studies by Bergström et al. and von Salomé et al. showed that many fewer excess alleles need to be explained than Ayala initially claimed—but that the estimate hovers on the border of what can pass through just two ancestors, it is possible that such an interbreeding solution might still be needed in order to explain present genetic diversity.

But, the question remains as to whether such a potentially ethically-problematic solution, entailing sexual intercourse between true men and subhuman animals, is really necessary.

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### More Recent Genetic Studies

In 2017, a series of unexpected events occurred that amply illustrate the need for caution in making claims about human beings’ origin. Biologist Dennis Venema published the claim that it was as certain as that the earth revolves around the sun that we came from a population of thousands.<sup>15</sup> This precipitated a prolonged discussion by scientists on the website, *Biologos*, which revealed that, despite all the claims, *no one had directly tested whether or not we could have come from a first human pair*. Recounting the story at *Evolution News*, molecular biologist Ann Gauger described how two scientists decided to finally directly test the possibility. They ran different computer models and, amazingly, they found that:<sup>16</sup>

A bottleneck of two that is older than 500,000 years ago cannot be ruled out. That does not mean such a bottleneck ever existed, but rather that the possibility cannot be excluded. Future models may change that number of 500,000 years, up or down... This is based on an analysis of the genetic data run by Drs. Schaffner and Swamidass, themselves evolutionary biologists and not ID supporters.

In the context of a lengthy and highly technical analysis on his blog, Dr. S. Joshua Swamidass, summarized the results as follows:<sup>17</sup>

A very recent bottleneck (say 50 kya) seems impossible, but a more ancient bottleneck of our ancestors (if very brief) at 500 kya might be consistent with the evidence. Sometime before 500 kya, this couple would not be *Homo sapiens*, but they might (exact dates debatable) be the common ancestor of *Homo sapiens*, *Denisovans*, and *Neanderthals*.

Swamidass realized that there was yet another way to disprove a first pair. If it could be shown that human beings share too many alleles (more than four) of any gene with chimps or gorillas, that would argue for our common descent from a population of more than two. (Adam and Eve could pass along only four.) This passing along of alleles between species by common descent is known as trans-species polymorphism (TSP). The gene family most likely to demonstrate TSP is the HLA family, including HLA-DRB1, the gene Francisco Ayala studied in 1995 in an attempt to demonstrate Adam and Eve were not possible.

In light of the model results described above, Dr. Swamidass re-examined Ayala’s work. Swamidass found a paper, published in *BMC Evolutionary Biology* (2016),<sup>18</sup> that analyzed the genetic networks of HLA genes, along with about 12,000 other genes. This study found that the apparent TSP of HLA-DRB1, along with other HLA genes (HLA-DPB1, HLA-C, HLA-A, and HLA-B), is probably due to convergent evolution. Human alleles are mutating over time toward the same sequence, likely due to selection that favors that sequence.

Referring to the results of that paper, Swamidass notes,<sup>19</sup> “... HLA-DRB1 is the most variable HLA gene. It is notable for having over 500 squares in the DNA of about merely 1,000 individuals, compared with an expected number of less than 10. That means if we had tried to put the DNA into a tree, we would see **at least** 500 mutations discordant with a phylogenetic tree. This is just a **stunning** result, because it means that HLA-DRB1 alleles are just not well described as a tree.”

What Swamidass means is that HLA-DRB1 shows signs of convergent evolution. The 500 squares he refers to are places where the HLA-DRB1 DNA sequence is more similar than it should be, showing

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signs of converging on a particular sequence. Thus, any similarity between chimpanzee and human HLA-DRB1 sequences is probably due to convergent evolution also, not TSP. This considerably weakens TSP as a challenge to a first pair.

Any conclusions based on the assumption of TSP are called into question. At this point, it seems *even TSP cannot be used to rule out a first hominin mating pair*.

This is on-going, exciting research, not yet published in a peer reviewed journal. It *shows that the claim that we had to come from a population of thousands was based on presumption and not proof. The claim that a first pair is impossible, when tested directly, was wrong. Finally, a first human mating pair is possible, but not proven.*

I am indebted to Dr. Ann Gauger, who pointed out all this recent research and its implications to me, and who has assisted me in my preparation of the scientific sections.

### Conclusion

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It was never the intent of this paper to offer scientific proof of Adam and Eve's literal reality. The sole purpose has been to show that they are *not scientifically impossible*.

Based on the best available evidence and analysis, this goal has been achieved.

The most recent research indicates that the best likelihood for there being two first parents for the human race is prior to half a million years ago. This finding comports significantly with my own speculation stated at the beginning of this article, namely, that, based on intellect-evincing artifacts, the probable time for the first true human beings—Adam and Eve—would be some three-quarters of a million years ago.

*This philosophical inference that the makers of such artifacts must be true human beings means that they would be proper candidates for being identical with*

*the possible "first hominin mating pair" discussed in the previous section.*

And yes, as Swamidass points out, given their ancient time frame, this would make them "the common ancestor of *Homo sapiens*, *Denisovans*, and *Neanderthals*."

Few understand that adequate speculative treatment of a literal Adam and Eve requires proper correlation of three disciplinary perspectives: theological, philosophical, and natural scientific. Theologically, Adam and Eve must be the first true human beings, and all true men must be their descendants. Philosophically, the first true man must be the first hominin possessing intellect and a spiritual soul—as evinced by artifacts, such as those artistic stone hand axes of three-quarters of a million years ago. This is the reason why "candidates" proposed more recently in time cannot possibly be the true first parents, since there is evidence that true humans would chronologically precede them. Finally, in terms of natural science, it must be shown that—unless there is need for recourse to the interbreeding hypothesis—a *bottleneck of just two true first human beings is possible*. A credible case for that very possibility in the speculative time frame that I propose has just been offered, as shown above.

*Therefore, a literal Adam and Eve is scientifically possible.*

To Christians, these miracles, especially when combined with the newfound evidence for the scientific possibility of a literal Adam and Eve, will serve to demonstrate the rational credibility of this foundational doctrine of the Faith.

Of course, the positive evidence for the actual existence of a literal Adam and Eve lies, not in natural science or philosophy, but in the two thousand years of Christian miracles, singularly embodied in the death and resurrection of Jesus Christ, the Redeemer promised by God to our first parents, Adam and Eve, after they had personally committed Original Sin. To Christians, these miracles, especially when combined with the newfound evidence for the scientific possibility of a literal Adam and Eve, will serve to demonstrate the *rational credibility* of this foundational doctrine of the Faith.

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## Post-Script

While the earlier cited comments by Dr. Joshua Swamidass about the first true human beings being possible 500,000 years ago were taken from his online blog, none of this was found in peer-reviewed journals. Subsequent to publication of the analysis that I present above, a peer-reviewed article on this same topic was, indeed, [published](#) by researchers O. Hossjer and Ann Gauger.<sup>20</sup>

These scientific researchers made a break-through achievement by succeeding in modeling “the demographic ancestry of humanity using the simplest of assumptions, with a homogeneous population whose size can vary over time.” In so doing, Drs. Hossjer and Gauger [demonstrated](#) “that a single-couple origin of humanity as recent as 500kya is consistent with data.” In a word, these scientists proved that the hypothesis presented in my earlier analysis could be verified in a realistic model.

This peer-reviewed scientific article demonstrated that a single mating couple, the biblical Adam and Eve, were scientifically possible and could be demonstrated as such according to a realistic genetic model – as long as they are dated at least five hundred thousand years ago.

This peer-reviewed scientific article demonstrated that a single mating couple, the biblical Adam and Eve, were scientifically possible and could be demonstrated as such according to a realistic genetic model – as long as they are dated at least five hundred thousand years ago. This finding, as shown earlier in this paper, comports perfectly with the philosophical and theological requirements that the first true human beings, Adam and Eve, actually existed and that all true human beings on planet Earth are descended from this single pair of first parents.

Given the number of those who, since Francisco Ayala’s faulty 1995 genetic study, have confidently insisted on the “scientific impossibility” of a literal Adam and Eve, one can scarcely overstate the importance of this peer-reviewed study by Drs. Hossjer and Gauger. These researchers have finally shown that an entirely realistic genetic model for a literal Adam and Eve now exists, provided we date our first parents far enough back in time.

## Critical Philosophical Point

A critical philosophical point must also be made. One cannot overstate the importance of establishing the correct date of true human beings first appearance. Philosopher of religion, William Lane Craig, points out that the first true humans must date back to prior to 500,000 years ago, based on evidence of higher levels of cognitive sophistication.

What needs to be pointed out, though, is that these higher levels of “cognitive sophistication” are not mere gradual developments of sentient abilities. Rather, they represent a leap to a qualitatively superior kind of operation and to a spiritual mode of existence.

That is why I noted earlier the critical importance of dating the discovery of Acheulean symmetrical stone hand axes and the controlled use of fire to about three-quarters of a million years ago. This is well before the half million years ago needed for the scientific possibility of a single mating pair of first true humans. Any clear evidence of true human beings at that early a date forces the time for Adam and Eve’s appearance at least that far back in time.

Unfortunately, many commentators do not seem to be aware that these signs of higher levels of “cognitive sophistication” are not merely more complex forms of sentient behavior. Rather, they represent the qualitatively superior genuinely spiritual operations of a spiritual, intellectual human soul.

Unfortunately, many commentators do not seem to be aware that these signs of higher levels of “cognitive sophistication” are not merely more complex forms of sentient behavior. Rather, they represent the qualitatively superior genuinely spiritual operations of a spiritual, intellectual human soul.

Without venturing into the Aristotelian science of philosophical psychology in depth, some indication of the reality of these new spiritual abilities in true human beings can be grasped by considering the difference between the sense image and intellectual concept. For example, one can imagine a triangle. (Most people immediately imagine an equilateral one!) But then, try to imagine the concept of

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“triangularity.” This simply cannot be done, since there are an infinite number of possible variant shapes, sizes, and physical instances of triangles. Yet, we clearly understand the meaning of “triangularity” as a geometrical concept defining any and all three-sided plane figures.

Again, it is easy to imagine a single human being or even many thousands of them standing in an open plaza – although the latter is actually reduced to a sea of heads! But one simply cannot imagine the universal concept of “humanity,” since its meaning in terms of the essence “rational animals” must apply to every conceivable human being that has ever lived or could even possibly exist at some future time. That is simply because we do not imagine a concept. We understand a concept’s meaning – a meaning that is not tied to any particular material instance of its application.

Even more evident is the spiritual nature of such a concept as justice. The image associated with the term, “justice,” may be that of a blind lady holding scales or of a court building or even the written word, “justice.” But everyone knows that such images are not the real meaning of justice in itself – a term whose meaning must apply to every possible just act.

Human language is filled with thousands of words that have universal applications of the meanings they represent. This is what gave rise in the last century to great interest in ape-language studies – a fascinating speculation that our fellow non-human primates might be able to be taught human language using American Sign Language or computer key boards. This hypothesis, in fact, gave rise to the famous “Planet of the Apes” movies that were spawned in that era and which continue even to the present day.

Unfortunately, careful scientific and philosophical analysis [showed](#) that our non-human primate brethren simply lack any true understanding of language structure or of the universal meanings of words. Like other animals, these non-human primates were adept at associating images with images and images with objects, but they possessed no actual understanding of the universal concepts for which these images were merely concrete, particular sense representations. Such critiques took their toll and eventually ape-language studies largely lost serious interest and funding.

Sense images are always under material conditions of space, shape, color, and so forth, while intellectual

concepts – being universal in nature — are entirely free of such particular physical properties. Since physical matter is always under such material conditions, human language and intellectual abilities must operate independently of matter.

From this, it follows that the human life principle or soul not only operates free of such material conditions, but rather, is in fact free from any dependence on such physical entities for its very existence – since what acts independently of matter must exist independently of matter. In a word, the radical distinction between sense images and intellectual concepts shows that true human beings possess an intellectual, spiritual soul. This line of argument is more fully developed [elsewhere](#).

This philosophically critical step — showing that true human beings have a qualitatively superior intellectual life and spiritual souls — is what must be added to any analysis of the first appearance of true human beings on Earth. Adam and Eve must have been these first true human beings.

Therefore, correct dating of the first unequivocal signs of genuine intellectual activity also shows that Adam and Eve must date at least that far back in time.

For example, those three-quarter million year old Acheulean hand axes mentioned earlier were congruently symmetrical. That meant that in order to carve the shape of the side facing the maker, one had to imagine and understand the congruent geometry of the unseen opposite side – clearly an intellectual act. In fact, Acheulean stone hand axes have been properly described as being genuinely artistic in nature. This dates intellectual activity – and thereby, Adam and Eve – to this very ancient time period, possibly even earlier.

This is not merely a paleoanthropological fact. Rather, it is a conclusion forced by philosophical necessity – proving the very ancient appearance of our first parents.

This is not merely a paleoanthropological fact. Rather, it is a conclusion forced by philosophical necessity – proving the very ancient appearance of our first parents. Still, so great a time span back to Adam is no more problematic for an individual person living in its midst than it would have been for someone

*Continues on page 10*

living half way between the time of Adam and Abraham, using the two thousand year span often calculated by biblical fundamentalists. Adam would still be a thousand years in the distant past with Abraham yet to be awaited for, patiently, a thousand more years in the distant future.

Any genuinely complete explanation of why a literal Adam and Eve are scientifically possible must include the foregoing philosophical observations. This

radical step from mere sense powers to the qualitatively superior abilities of a spiritual-souled human being is precisely that which absolutely required God's decisive intervention at some point in time to create the first true human beings – primates with genuine intellectual powers and spiritual souls. Thus did appear, at least three-quarters of a million years ago, the single mating pair, Adam and Eve – the first parents of all true human beings, who subsequently have lived on planet Earth. ■



**Dr. Dennis Bonnette** retired as a Full Professor of Philosophy in 2003 from Niagara University in Lewiston, New York. He taught philosophy there for thirty-six years and served as Chairman of the Philosophy Department from 1992 to 2002. He lives in Youngstown, New York. He and his late wife, Lois, have seven adult children and twenty-five grandchildren. He received his doctorate in philosophy from the University of Notre Dame in 1970. Dr. Bonnette taught philosophy at the college level for 40 years and has taught free courses at the Aquinas School of Philosophy in Lewiston, New York. He is the author of numerous books, including *Aquinas' Proofs for God's Existence* (The Hague: Martinus-Nijhoff, 1972) and *Origin of the Human Species* (Ave Maria, FL: Sapientia Press, third edition, 2014), and many scholarly articles.

## Endnotes

- <sup>1</sup> This article first appeared online on the *Strange Notions* website. Available online at <https://strangenotions.com/the-scientific-possibility-of-adam-and-eve/>. Please note Post-Script at end of this article.
- <sup>2</sup> *Humani Generis*, n. 37
- <sup>3</sup> CCC, 404.
- <sup>4</sup> Available online at <http://www.godandscience.org/evolution/ape-language.html>. (Editor was unable to access link on March 14, 2026.)
- <sup>5</sup> Dennis Bonnette, *Origin of the Human Species* (Sapientia Press, third edition, 2014), 69-71, 103-110.
- <sup>6</sup> *Ibid.*, Preface to Third Edition, *xiv*.
- <sup>7</sup> *Ibid.*, 163-164.
- <sup>8</sup> John Hawks *et al.*, "Population Bottlenecks and Pleistocene Human Evolution," *Molecular Biology and Evolution* 17, no. 1 (2000): 2-22.
- <sup>9</sup> Ann Gauger, "The Science of Adam and Eve," in *Science and Human Origins*, Ann Gauger, Douglas Axe, and Casey Luskin (Seattle, WA: Discovery Institute Press, 2012), 105-122.
- <sup>10</sup> P. Sjödin, I. Kaj, S. Krone, †M. Lascoux and M. Nordborg, "On the Meaning and Existence of an Effective Population Size," *Genetics* 169 (February 2005): 1061–1070 ; J. Hawks, "From Genes to Numbers: Effective Population Sizes in Human Evolution," in *Recent Advances in Paleodemography*, ed. Jean-pierre Bocquet-Appel (Springer Netherlands, 2008), 9-30. See also, Dennis Venema and Scot McKnight, *Adam and the Genome: Reading Scripture after Genetic Science* (Brazos Press, 2017).
- <sup>11</sup> Francisco J. Ayala, "The Myth of Eve: Molecular Biology and Human Origins," *Science* 270 (1995):1930-1936.
- <sup>12</sup> Tomas Bergström *et al.*, "Recent Origin of HLA-DRB1 Alleles and Implications for Human Evolution," *Nature Genetics* 18 (1998): 237-242.
- <sup>13</sup> Jenny von Salomé *et al.*, "Full-length sequence analysis of the HLA-DRB1 locus suggests a recent origin of alleles," *Immunogenetics* (2007) 59: 261–271.
- <sup>14</sup> Available online at <https://www3.nd.edu/~afreddos/papers/kemp-monogenism.pdf>.
- <sup>15</sup> Available online at <https://www.amazon.com/Adam-Genome-Reading-Scripture-Genetic/dp/158743394X>.
- <sup>16</sup> Available online at <https://evolutionnews.org/2018/03/is-there-a-first-human-couple-in-our-past-new-evidence-and-arguments>.
- <sup>17</sup> Available online at <https://discourse.peacefulscience.org/t/heliocentric-certainty-against-a-bottleneck-of-two/61/16>.
- <sup>18</sup> Available online at [http://www.ieu.uzh.ch/wagner/papers/Vahdati\\_BMCEvoBio\\_2016.pdf](http://www.ieu.uzh.ch/wagner/papers/Vahdati_BMCEvoBio_2016.pdf). (Editor was unable to access link on March 14, 2026.)
- <sup>19</sup> Available online at <https://discourse.peacefulscience.org/t/heliocentric-certainty-against-a-bottleneck-of-two/61/16>.
- <sup>20</sup> See: Hossjer O, Gauger A (2019) A single-couple human origin is possible. *BIO-Complexity* 2019 (1):1-20. doi:10.5048/BIO- C.2019.1. [https://www.researchgate.net/publication/337498987\\_A\\_Single-Couple\\_Human\\_Origin\\_is\\_Possible](https://www.researchgate.net/publication/337498987_A_Single-Couple_Human_Origin_is_Possible)

## Evolutionary Science Strengthens Belief in God

by Steven J. Green

Reprint from *ITEST Bulletin Vol. 39 #3 (Summer 2018)*

The evolution of humans from apes is a widely accepted theory in scientific circles. Many scientific evolutionary theories have been presented to the public based on fossil research and discoveries made in Africa. Fossil evidence of *Homo sapiens* recently found in Morocco is one example that the human evolutionary process potentially spanned across all of the African continent during a rapid time period, an estimated 315 thousand years ago. But how does continued scientific research such as this stand in regard to the story of Creation in the Bible? Can human evolution be accepted by a believer when Adam and Eve are considered the origin of humanity? What does the Catholic Church teach about this matter? Evolution may have played an unknown role in the history of the world, but Adam and Eve, the parents from which all human beings spawned, were created by God. This paper aims to show the believer how science can help solidify the belief in God and His Creation.

Can human evolution be accepted by a believer when Adam and Eve are considered the origin of humanity?

The scientific paper, “New Fossils from Jebel Irhoud, Morocco and the Pan-African Origin of *Homo sapiens*,” published in *Nature*, and conducted by Moroccan Institut National des Sciences de l’Archéologie et du Patrimoine and the Department of Human Evolution of the Max Planck Institute for Evolutionary Anthropology, analyzed fossils found in Morocco. These fossils were then compared to other African-found humanoid and primate fossils on record. The Morocco fossils showed evidence of being the oldest African examples of modern morphology. The massive excavation yielded several valuable fossils: an adult braincase, an immature mandible (jaw bone), an immature humeral shaft, an immature hip bone, and a fragmented mandible. Unfortunately, of all of these, records showed that only the humeral shaft was properly documented by identifying the precise location in which it was found. This complicated the research and resulted in many uncertainties regarding the age of these fossils. It was originally thought that these fossils were 40 thousand years old and were a form of Neanderthal (archaic humans).

However, it was more probable that the fossils were much older, as evidence from the excavation site suggested a mid-Pleistocene time period (~780 to 125 thousand years ago).

Specific scientific methods were utilized on each specimen. Computerized isotropic testing of both dental and non-dental samples were used in conjunction with virtual reconstruction. The fossil fragments were scanned and pieced together digitally. The gaps were filled virtually to recreate a face and skull. The shape of the reconstructed face was paramount to the cranial analysis to determine morphology. Dental metrics from across global research centers were used as comparative models. The morphology of these tests showed that the Morocco fossils are closely related to *Homo sapiens*, as opposed to Neanderthals or non-sapien Pleistocene samples. Interestingly enough, the testing does show similarities between the dental samples and other groups from Northern Africa. The roots from the molars of the mandible and the development of the dental samples are in-line with recent modern humans (RMH).



Image created with Gemini

The testing methods concluded that morphology was accelerated and showed evidence that the braincase contained a series of genetic changes, yet the fossils appeared to be more than a morphological stepping stone between Neanderthals and RMH. There was almost no facial morphology distinction when compared to modern humans, despite the estimated 300

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thousand year difference. Additionally, the evidence gained from the Morocco fossils helped reinforce the idea that a rapid anatomical shift occurred across the African continent between early *Homo sapiens* and Africa's archaic Pleistocene specimens. "The Irhoud fossils currently represent, to our knowledge, the most securely dated evidence of the early phase of *Homo sapiens* evolution in Africa."<sup>1</sup>

The scientific research and study contained in this paper, at first glance, shows to heavily support human evolution through fossil evidence. However, the reader must remember that the authors are scientists, who are writing a scientific paper for the sake of science. The beliefs by which a theologian or philosopher live are not considered in the research. The scientists' aim is to catalog, report, examine, and test the evidence to develop a plausible explanation. This explanation is not, and must not, be considered fact, but rather scientific theory. The Catholic Church's stance on science was made clear in Pope Leo XIII's encyclical *Providentissimus Deus*:

There can never, indeed, be any real discrepancy between the theologian and the physicist, as long as each confines himself within his own lines... If dissension should arise between them here is the rule also laid down by St. Augustine, for the theologian: "Whatever they can really demonstrate to be true of physical nature, we must show to be capable of reconciliation with our Scriptures; and whatever they assert in their treatises which is contrary to these Scriptures of ours, that is to Catholic faith, we must either prove it as well as we can to be entirely false, or at all events we must, without the smallest hesitation, believe it to be so"...Hence they did not seek to penetrate the secrets of nature, but rather described and dealt with things in more or less figurative language, or in terms which were commonly used at the time, and which in many instances are in daily use at this day, even by the most eminent men of science.<sup>2</sup>

There can never, indeed, be any real discrepancy between the theologian and the physicist, as long as each confines himself within his own lines...

In some cases, science can help with explanations, but the believer's faith should not be shaken because

of the science. Again, research and theories about a given topic are not definitive truth. Many examples of science improving upon its own theories, or correcting theories originally thought to be true, can be found (e.g. the earth was flat, the indivisibility of the atom, etc.). As the Catechism of the Catholic Church puts it, "[m]ethodical research in all branches of knowledge, provided it is carried out in a truly scientific manner and does not override moral laws, can never conflict with the faith, because the things of the world and the things of the faith derive from the same God."<sup>3</sup> The specific science theory of evolution addressed above contained several key phrases and word choices used by the authors that indicate ambiguity in the research. These ambiguities should help the believer understand there are some questions that have yet to be answered by science:

- "...the exact place and time of emergence of *H. sapiens* remain obscure..."
- "...it is unclear whether the present day 'modern' morphology rapidly emerged..."
- "The interpretation of the Irhoud hominins has long been complicated by persistent uncertainties..."
- "It has therefore been suggested that the archaic features of the Irhoud fossils..."
- "This pattern, which may include some primitive retentions..."
- "Among the Irhoud hominins these structures are rather variable and this variability may be related to..."
- "The Irhoud fossils currently represent, to our knowledge, the most securely dated evidence..."
- "Delimiting clear-cut anatomical boundaries for a 'modern' grade within the *H. sapiens* clade thus only depends on gaps in the fossil record..."

These examples are not listed to show scientific incompetence, but rather to show that fossil evidence can only drive a theory or hypothesis so far. Much of scientific research depends upon the available technology and previously discovered fossils, and as the Morocco research mentioned, there are holes in the fossil record. Even though scientific claims pool relevant data, use updated technology, and consult past records to help build the human evolution case, the Catholic faithful should proceed with caution and refer to what God and His Church teaches and advises.

The theory of evolution is not explicitly defined by

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the Church as being wrong, but the Church does specify that only God can be the ultimate Creator: “the world and all things which are contained in it, both spiritual and material, as regards their whole substance, have been produced by God from nothing.”<sup>4</sup> The Magisterium has concluded that if evidence points to the evolution of any living being over any period of time, it was done under the guidance of God.

The theory of evolution is not explicitly defined by the Church as being wrong, but the Church does specify that only God can be the ultimate Creator ...

As Catholics we believe what the Book of Genesis describes: God is the Creator of all things, to include mankind and his soul. Even though decades of extensive research and scientific data attempts to prove otherwise, the Catholic Church teaches the man and his soul are ascribed to God alone. The rational soul could not have evolved from an irrational being and “the Catholic faith obliges us to hold that souls are immediately created by God.”<sup>5</sup> Pope Pius XII expressed in one of his encyclicals that “the faithful cannot embrace that opinion which maintains... that

after Adam there existed on this earth true men who did not take their origin through natural generation from him.”<sup>6</sup> Human evolution and science have their place with faith, but it cannot replace faith.

Science research, although meticulous in nature, cannot answer every question. In fact, by providing one or two answers, the research can even conjure more unanswerable questions. The data often times is filled with vague words that cannot wholly support the claim despite being supported by other scientists. The advantage for the theologians and philosophers is they have the ability to extrapolate conclusions in the light of faith without having the obligation to accept all that science has claimed to have discovered as truth. The Church has been explicit in stating that God is the ultimate Creator of all things, regardless of science’s input. Science will continue to expand upon and redefine its own discoveries while seeking the truth and the faithful must be sure to read these discoveries with a clear understanding and perspective. For the believer the realization is simple: no matter if science discovered a new way to test fossils, or if science claims a new truth, or believes to have shed light on a new evolutionary discovery, the Way, The Truth, and the Light have already been discovered in Christ Jesus. ■

Steven J. Green graduated from Holy Apostles College and Seminary in 2019 earning a Master of Arts Theology degree with an apologetics concentration. A native of Connecticut, a US Air Force veteran, and a convert to the faith, he currently lives in Idaho with his wife and two children. He works at St. Paul’s Catholic Church as the Director of Youth Ministry, where he engages with youth in both middle school and high school, leading them closer to God and the Sacraments.

### End Notes

- <sup>1</sup> Hublin, Jean-Jacques et al. “New Fossils from Jebel Irhoud, Morocco and the Pan-African Origin of Homo sapiens.” *Nature*, no. 546 (2017): 291.
- <sup>2</sup> Pope Leo XIII, Encyclical on the Study of Holy Scripture *Providentissimus Deus* (18 November 1893), §18.
- <sup>3</sup> *Catechism of the Catholic Church*, 2nd ed. (Washington, DC: United States Catholic Conference, 2000), 159.

- <sup>4</sup> First Vatican Council, Session 3, Dogmatic Constitution on the Catholic Faith (24 April 1870), in Canons, 1.5, at EWTN, [www.ewtn.com](http://www.ewtn.com).
- <sup>5</sup> Pope Pius XII, Encyclical on the Human Race *Humani Generis* (12 August 1950), §36.
- <sup>6</sup> *Humani Generis*, §37.

“More appropriate, I should think, is the view that God created the universe, out of an interest in spontaneous creativity -- that He wanted nature to produce surprises, phenomena that He Himself could not have foreseen. What would such a creative universe be like? Well, it would for one thing be impossible to predict in detail. And this seems to be the case with the universe we inhabit... Further a creative universe should give rise to agencies that are themselves creative, which is to say unpredictable. There is in our universe such an agency, spectacularly successful at reversing the dreary slide of entropy and making surprising things happen. We call it life.”

Timothy Ferris in *The Whole Shebang*

Reader Feedback

## How Many Apes Are Required Before One of Them Can Utter an Intelligible Sentence

By Frank Calneggia © 2026

“Opening Message” of *FiRST Principles* Vol. 56, #2, April 2025 from which I quote:

“How thrilled am I, then, to finally have time to ‘lift my head’ and read of the many wonderful – sometimes mind-boggling – new efforts of scientists around the world. ... A new genomic study at MIT suggests that human language capacity emerged 135,000 years ago, with implications for our understanding of what makes our roughly 230,000-year-old species unique.

Today, I feel the hope and wonder that drive all ITEST members in our embrace of our religious faith as well as the beauty of a rigorous science – clear-eyed, methodologically secure, and always seeking truth where it may be found.”

As the second quoted paragraph follows immediately upon the first one quoted, one concludes that the referenced MIT study is the editor’s choice of “rigorous science” that is “clear-eyed, methodologically secure, and always seeking truth where it may be found” that he hopes will help “drive all ITEST members in our embrace of our religious faith.”

I am one of those ITEST members - to whom the Editor of “First Principles” proposed a roughly 100,000 year time span of human history before any man or woman was able to utter an intelligible sentence and have it understood by someone else, as a witness to ‘science’ - which supposedly supports my ‘religious faith.’ Consequently I should have the right to reply, on the same terms the Editor made his aforementioned recommendation (or exhortation); that is to say, by using words and language of my own choice in order to uphold *the* first principle “always seek truth where it may be found,” which has as its shadow the other side of the principle of non-contradiction ‘to always expose error where it may be found.’

The ‘science’ that supposedly supports my ‘religious faith,’ i.e., the ‘science’ that supposedly supports my *Catholic Faith* is stated to be:

1. The human race has existed for 230,000 years.
2. Human language capacity emerged (i.e., came into existence) 135,000 years ago.
3. For 100,000 years human beings lived without being able to talk to each other.

What the Faith of the Catholic Church teaches me without the ‘benefit’ of such ‘science’ is as follows:

1. The first 11 chapters of the book of Genesis are not myths or fables, but are uniquely and truly revealed by

God, which means that the special creation of man in the image and the likeness of God, the Fall of our first parents, Adam and Eve, the Promise of the Redemption, the Universal Flood, the Tower of Babel and confounding of human languages are all and singly historically true. (Cf. *Declarations of the Pontifical Biblical Commission: “Concerning the Historical Character of the First Three Chapters of Genesis”* June 30, 1909 (AAS 1 [1909] 567ff; EB 332ff; Dz 2121ff) and “Letter to Cardinal Suhard” [on the Mosaic authorship of the Pentateuch, and on the historical character of Gen 1-11] (AAS 40 [1948] 45-8) The chronology of the Old Testament proves that Adam and Eve lived approximately 6,000 years ago. It is a Dogma of Catholic Faith that Adam and Eve are the first man and the first woman and were created immediately by God with Eve being created from Adam’s side or ‘rib.’

2. Human language began with Adam the first man and Eve the first woman. Just read the first three chapters of Genesis if you need to be convinced. Adam and Eve certainly understood the words they spoke to each other, the words that God spoke to them including the promise of a Redeemer, the words by which Satan lured them into the Original sin, the curse God pronounced on Satan after he engineered their downfall, etc.
3. We need not bring in Catholic Faith to see the absurdity of the MIT ‘scientific’ claim that human beings lived, even for a moment (MIT asserts 100,000 years), without “language capacity.” The refutation of this nonsense is undertaken as follows in the light of human reason: Words are conventional signs of concepts (i.e. concepts had in intellect, where intellect is a faculty of a spiritual soul). Concepts are natural signs of things. All created spiritual souls, i.e. all human beings, have a natural “language capacity” or better, a natural potential to express by sense perceptible signs (spoken or written) concepts had in intellect. All that is required to activate this natural potential in a child is to teach it words and sentences. To say, as the so called ‘science’ says, that this natural potential of every spiritual soul only became present in the human race after the human race existed (for any period of time whatsoever) without this faculty of the human soul is to violate the principle of non-contradiction because it says that some human being has no spiritual soul, and is therefore not human, i.e., that some being is both human and non-human at the same time and in the same sense.

So, in conclusion I repeat the title of my rebuttal: How many apes are required before one of them can utter an intelligible sentence. ■