

Welcome!

Ratio Christi, meaning “reason for Christ” in Latin, serves to defend the Christian faith in honest dialogue with both our skeptical & believing friends.

Weekly Meetings: Thursday @ 8:30 pm

MSC 2401

RC-TAMU.org



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Ratio Christi
Texas A&M



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Thomistic Institute

The Thomistic Institute exists to promote Catholic truth in our contemporary world by strengthening the intellectual formation of Christians at Texas A&M University, in the Church, and in the wider public square. The thought of St. Thomas Aquinas, the Universal Doctor of the Church, is our touchstone.

Reading Group Details in the Slack

thomisticinstitute.org/texas-am



Secular Students Alliance

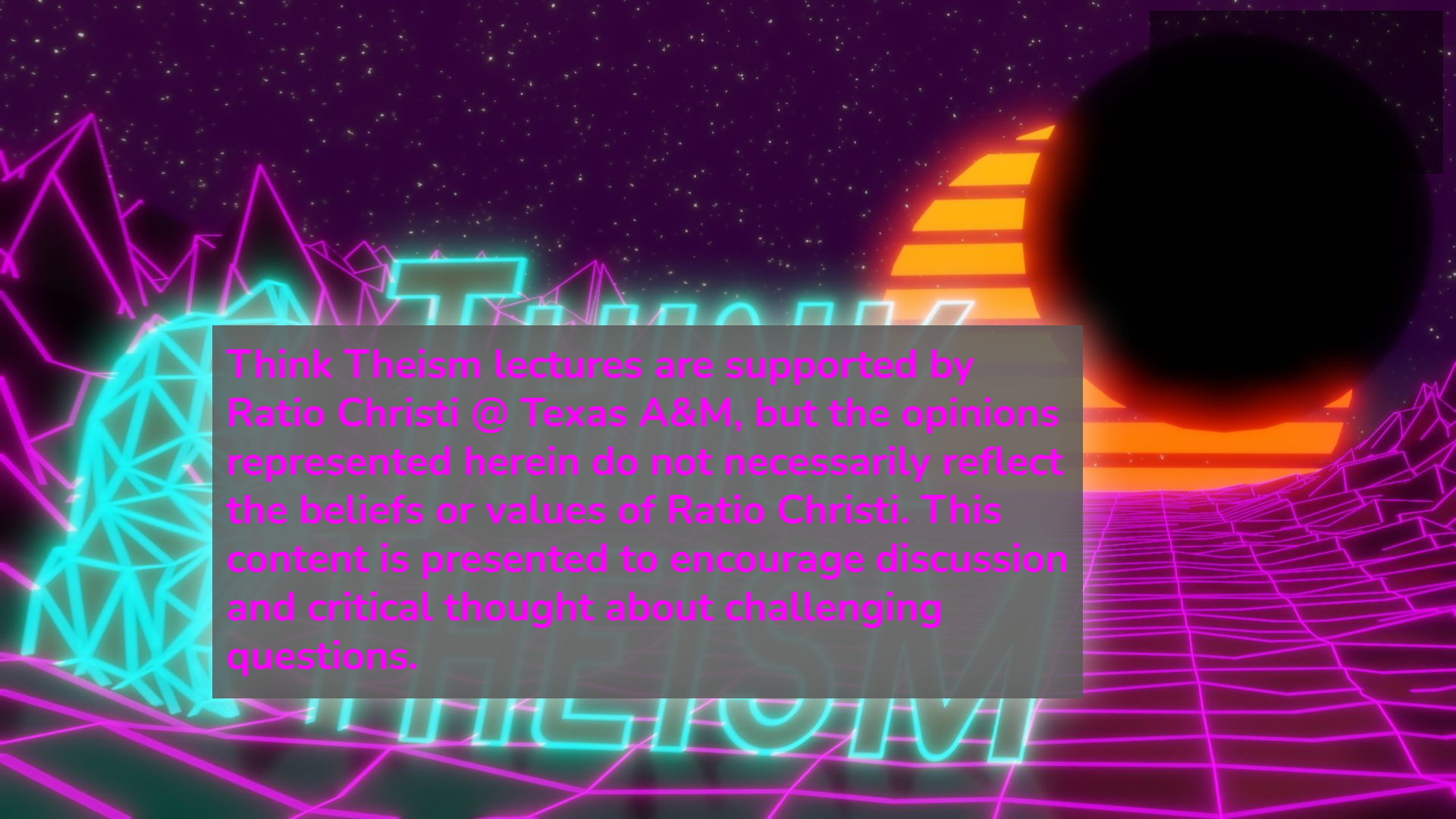
The Secular Student Alliance seeks to provide a support network for the atheists, agnostics, and otherwise secular peoples of Texas A&M University.

SSA brings together people from a wide range of religious and ideological backgrounds in order to foster deeper levels of understanding through discussion and dialogue.

Weekly Meetings: Thursdays @ 8:30 pm, MSC L526A

facebook.com/groups/TAMUSecularStudentAlliance





Think Theism lectures are supported by Ratio Christi @ Texas A&M, but the opinions represented herein do not necessarily reflect the beliefs or values of Ratio Christi. This content is presented to encourage discussion and critical thought about challenging questions.



- Humanity has rejected God, the source of life and goodness.
- Seeking our own ends, we have become victims and agents of evil, death, and misery.
- God, not willing we should perish, entered a covenant of grace to deliver humanity from this miserable state by means of a Redeemer.
- Begun with the Hebrew people, this covenant reached its fulfillment in Jesus who overcame the powers of evil, death, and misery in his death and resurrection.
- Jesus calls for all humanity to turn away (i.e. repent) from evil to the Kingdom of God.

aka

IF JESUS,

**But don't we know better now?
Science makes Jesus irrelevant.
MONKE?**

*How can Gospel be true since it is based on bad
science?*

Does Science Destroy the Gospel?

Contemporary science is often presented as being in massive contradiction to the teaching of the Christian scriptures.

Three key areas of contention are:

1. **Cosmology**
2. **Biology**
3. **Anthropology**

I don't care what the Gospel teaches... it is based on incorrect ancient Science; Why should I believe what the Bible says about spiritual things if gets science so wrong?

Alvin the Atheist

Carol the Christian



What is the Argument?

There are several directions we can go here:

1. The Bible teaches falsehoods regarding science, therefore it is untrustworthy about spiritual matters
2. The Gospel message is fundamentally based on flawed science, and therefore cannot be true

I don't care what the Gospel teaches... it is based on incorrect ancient Science; Why should I believe what the Bible says about spiritual things if gets science so wrong?

Alvin the Atheist

Carol the Christian

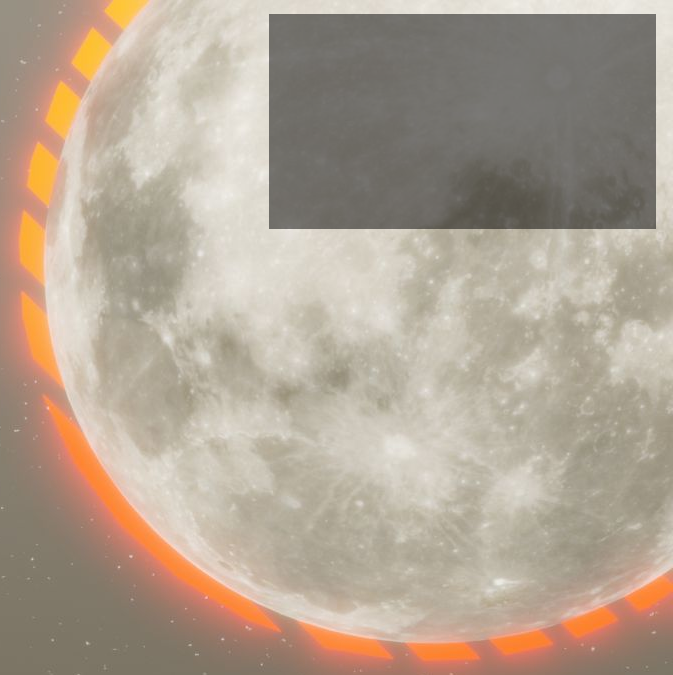


Argument 1

P1. If the Bible teaches scientific errors, then the Bible is untrustworthy in spiritual matters

P2. The Bible teaches scientific errors

C. The bible is untrustworthy in spiritual matters



Response 1: Denial of Inerrancy

~~P1. If the Bible teaches scientific errors,
then the Bible is untrustworthy in
spiritual matters~~

P2. The Bible teaches scientific errors

C. The bible is untrustworthy in
spiritual matters

**This is a live option; but may put
you outside the evangelical pale.**



Reminder: Inerrancy

- Being wholly and verbally God-given, **Scripture is without error or fault in all its teaching**, no less in what it states about God's acts in creation, about the events of world history, and about its own literary origins under God, than in its witness to God's saving grace in individual lives.
- We affirm that **God in His Work of inspiration utilized the distinctive personalities and literary styles of the writers** whom He had chosen and prepared.
- We deny that Biblical infallibility and inerrancy are limited to spiritual, religious, or redemptive themes, exclusive of assertions in the fields of history and science. We further deny that scientific hypotheses about earth history may properly be used to overturn the teaching of Scripture on creation and the flood.

Response 2: Does the Bible Really Teach Error?

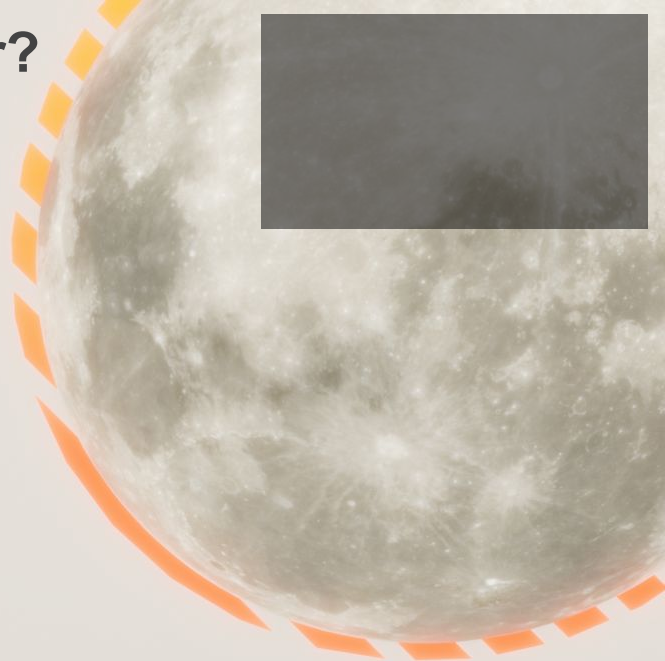
P1. If the Bible teaches scientific errors, then the Bible is untrustworthy in spiritual matters

P2. The Bible teaches scientific errors?

C. The bible is untrustworthy in spiritual matters

What does the Bible actually teach?

*Mostly this teaching is contained in **Genesis***





We are not free to interpret scripture any way we please. We must understand it the way it is intended to be understood.

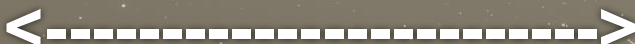
Where Does
Genesis Fall?

Literal <-----> Non-literal

What are our Options?

Neo-Ussherianism

Genesis' teachings on cosmology, biology, and anthropology contradict contemporary science because science is corrupted by sin or the product of an anti-Christian conspiracy.

Literal  Non-literal

"Liberalism"

Genesis' teachings on cosmology, biology, and anthropology contradict contemporary science because Genesis was written by ancient people who had incorrect views of science, and Genesis is in error.

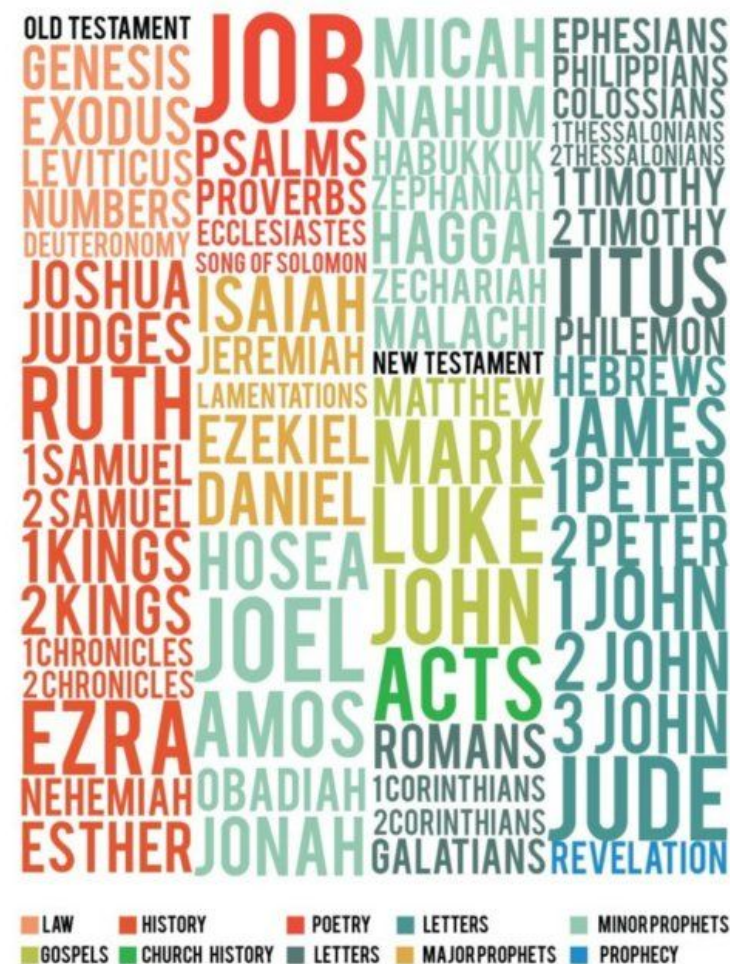
How do we interpret the Bible?

Biblical Interpretation is *Hermeneutics*

Definition:

- The science of interpreting a text, particularly Scripture

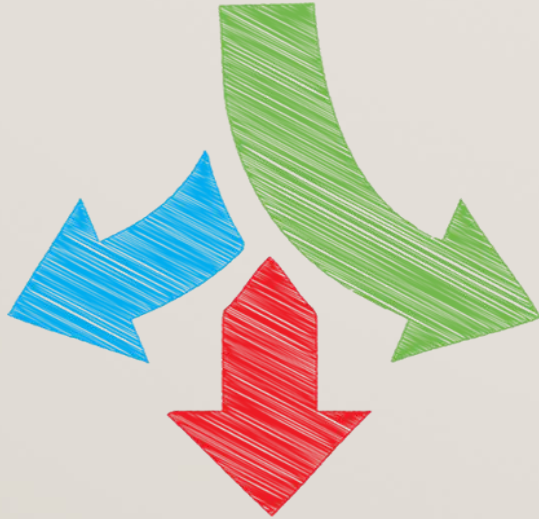
Discovering the
MEANING



WHAT IS THE SOURCE OF MEANING in a Text?

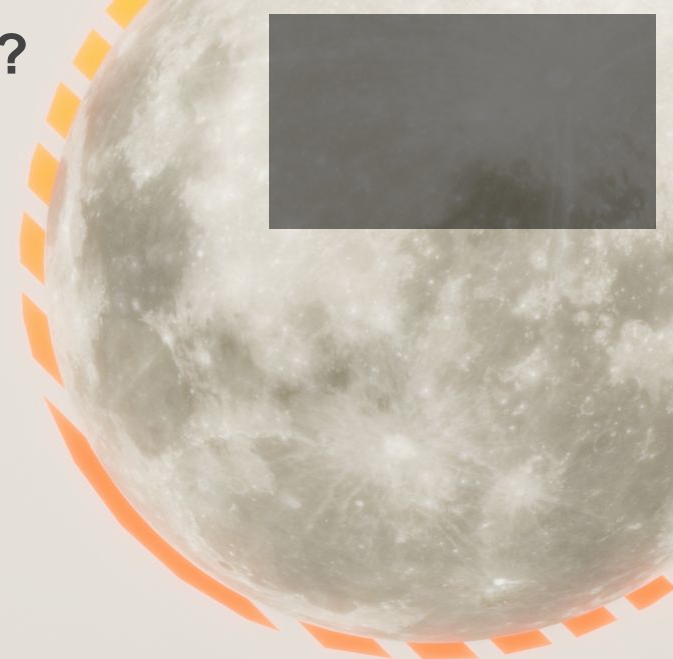
Three Choices

The Reader
subjectivism



The Author

The Text
word study trap



How do I interact with the ancient author?

Cooperation of the reader is required for the author to effectively convey his meaning

An **uncooperative** reader fails to meet the author where he is, and consequently will not understand the author's meaning.

A lack of cooperation in communication can result in a **JOKE!**

*"There is a knock at the door and a man tells his robot, **Robot, go answer the door.**" And the robot dutifully approaches the door and said, **Yes, door, what was it that you asked?**"*

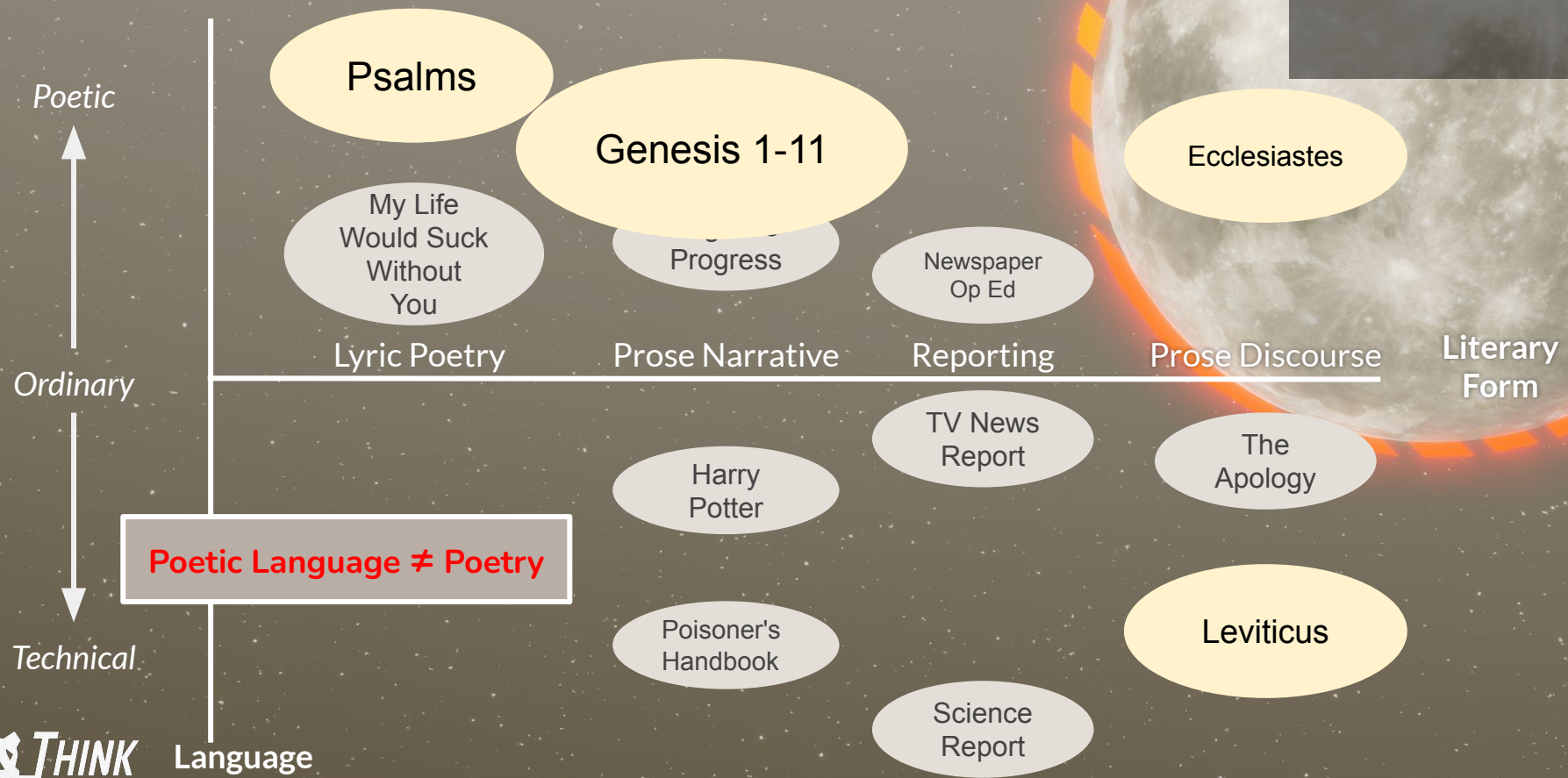
*"The first qualification for judging any piece of workmanship from a corkscrew to a cathedral is **to know***

- 1) **what it is***
- 2) **what it was intended to do, and***
- 3) **how it is meant to be used."***

~C.S. Lewis

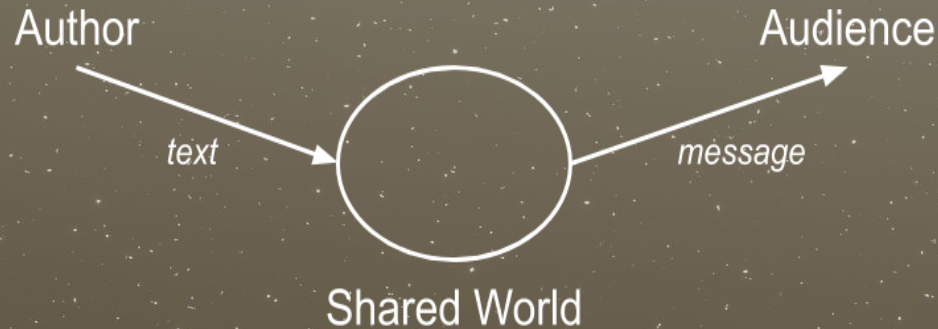


Literary Form vs. Language Type



Genre and The World Picture

- Authors rely on a shared world picture to communicate
 - Knowledge, belief, values, experiences, language, literary conventions
 - The Author **DOES NOT REPEAT** what is included in the world picture
 - **We have to reconstruct the shared world of the author and audience to understand the text!**



So How Can We Understand What a Text IS?

Genre!

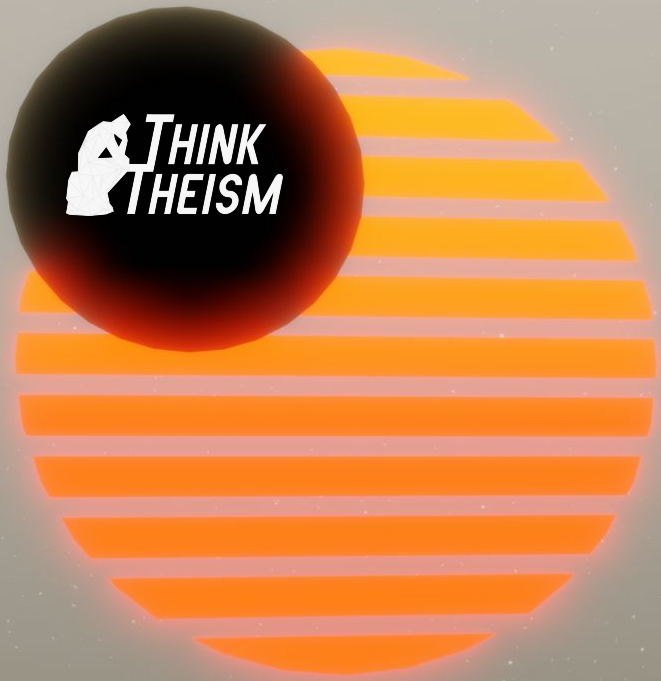
- Genre is a grouping of texts that all have similar:
 - Structure
 - Language
 - Purpose
 - Audience
- Genre is an important part of the shared understanding between author and audience

Genre ≠ literary form ≠ style ≠ register ≠ language

Genre: A social and communicative act, with its associated linguistic, rhetorical, and literary conventions and expectations.

Collins, C. John. Reading Genesis Well (p. 48). Zondervan Academic. Kindle Edition.





History?

Hebrew Poetry?

What is the Genre of Genesis 1-11?

Genre of Genesis



IS GENESIS A
MYTH?!?

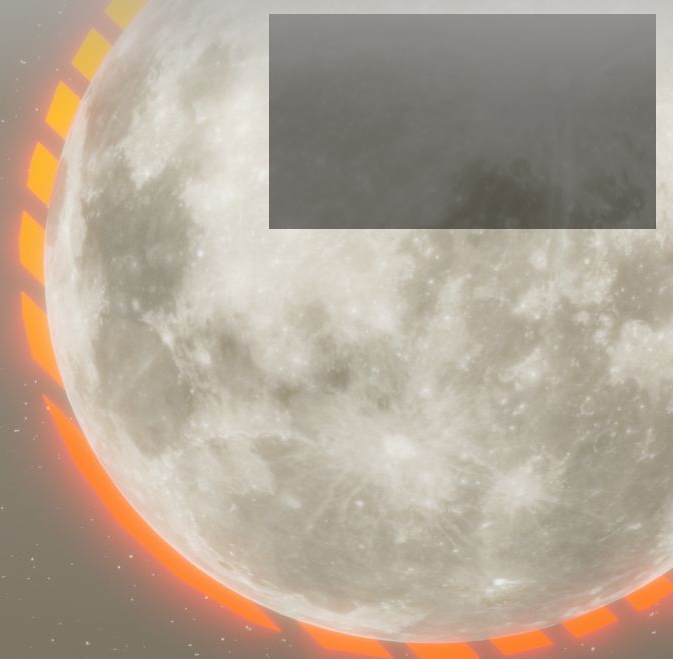
The Folklorist's Myth: Not a Falsehood

We are using a technical term, not the common usage in ordinary language

Myth: Sacred narratives which explain how the world and man came to be in their present form.

Myth is a genre! The author of Genesis is using this genre... but why?

If Genesis is a “myth” what does that say about how it should be interpreted? Is it historical? How did ancient cultures understand their myths?



But Genealogies!

1. The genealogies transition smoothly from “mythic” narratives
2. The genealogies form an unbroken line to clearly historic figures (e.g. Abram)
3. Even in the ANE myths, the genealogies connect to historical figures
4. There are no clear examples of unhistorical people included in ANE genealogies/king lists

We should amend our genre:

Mythic elements are woven into a real timeline with presumed historic people. This genre was identified by Thorkild Jacobsen in his study of the Eridu Genesis.

Mytho-History



**THINK
THEISM**

What are our Options?

Neo-Ussherianism

Genesis' teachings on cosmology, biology, and anthropology contradict contemporary science because science is corrupted by sin or the product of an anti-Christian conspiracy.

Literal <-----> Non-literal

"Liberalism"

Genesis' teachings on cosmology, biology, and anthropology contradict contemporary science because Genesis was written by ancient people who had incorrect views of science, and Genesis is in error.

**Monotheistic
Hebrew
Mythohistory**

Genesis 1-11: Genre? Rules of the Road

- **Consider Genre:**

- Texts are written BY people, FOR people
- Try to determine how the **original author** and **audience** would have understood the text

- **Answer Lewis' Questions:**

- What is the it? What does it do? How is it used?

- **No concordism!** (Reading science into the text)

- Ancient authors were not trying to communicate today's science!
- Reads obsolete science into the text...

- **Seek an integrated faith**



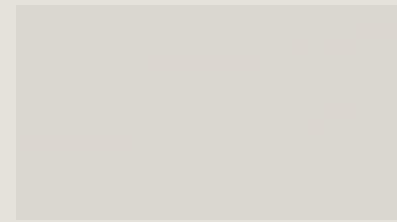
What does this mean for our study of Genesis?

- 1. It is important to put yourself into the shoes of the ancient author and audience**
 - You cannot do this without trying to understand their **shared world**
 - One part of doing this is by being familiar with the literature they would have known
 - Ask: “How would an ancient hearer have understood this?”
- 2. Cooperate with the author to discover their meaning**
 - Refusing to recognize the form of communication the author is using fails to cooperate in the act of communication
- 3. Genesis 1-11 is related in some way to other ANE texts, but the nature of this relationship is complicated**
 - Themes and episodes from ANE literature are also present in Gen. 1-11
 - However, there are glaring differences, primarily in theology
 - NOTE: Genesis is not *derived* from ANE myths

What does this mean for our study of Genesis?

4. **Some Old Testament scholars classify Genesis as Mytho-History**
 - This technical use of the word “**myth**” does not imply falsehood
 - Mytho-history implies a true interest in history and historical persons by the author
 - In particular, the genealogies demonstrate this interest in “real” history
5. **If Genesis is Mytho-History, we can't assume details are intended as historical**
 - All of Genesis 1-11 could still be literally true, but the text does not intend to “affirm” or “teach” this literality, as it is not intended by the author
 - However, the **genealogies** suggest that the author intended his characters to be taken as **real historical persons**
6. **The Mytho-Historical genre does not extend beyond Genesis 11**
7. **After understanding the original author's meaning, what do New Testament authors have to say?**

Scientific-Theological Battlegrounds



General Question	Biblical Data	Scientific Data	Integrative Views
How old is the earth/universe?	Days of Genesis	Radiometric dating, distant starlight, etc.	Young-Earth vs Old-Earth
How is life related?	Animal kinds	Fossils, morphology, similar genetic code	Common ancestry vs common design
How did life diversify?	God's action in creation	Mutation + selection	Creationism vs Intelligent Design vs Darwinism
How did humanity originate?	Eve and Adam, Adam-Christ typology	Shared primate ancestry, population genetics, etc.	Historical Adam vs Non-Historical Adam

Argument 1

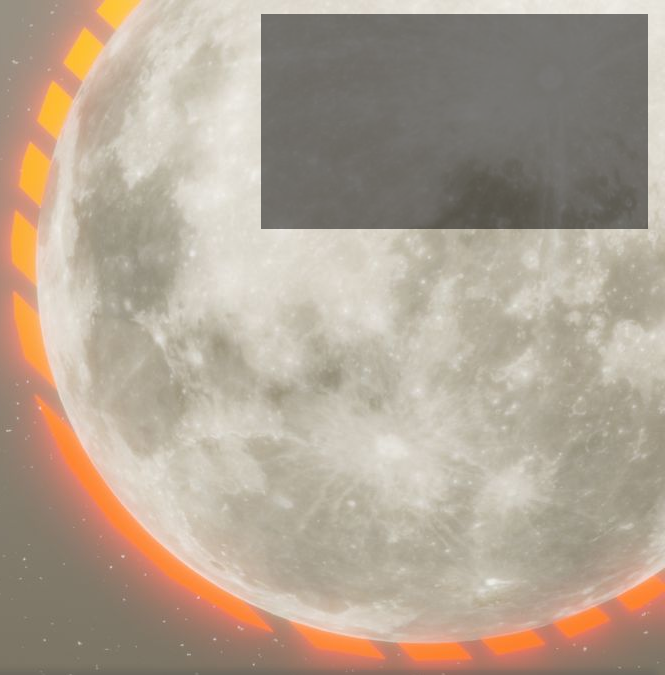
P1. If the Bible teaches scientific errors, then the Bible is untrustworthy in spiritual matters

P2. The Bible teaches scientific errors

C. The bible is untrustworthy in spiritual matters

Response 2: Much of Genesis can be taken non-literally

Response 1: Deny Inerrancy

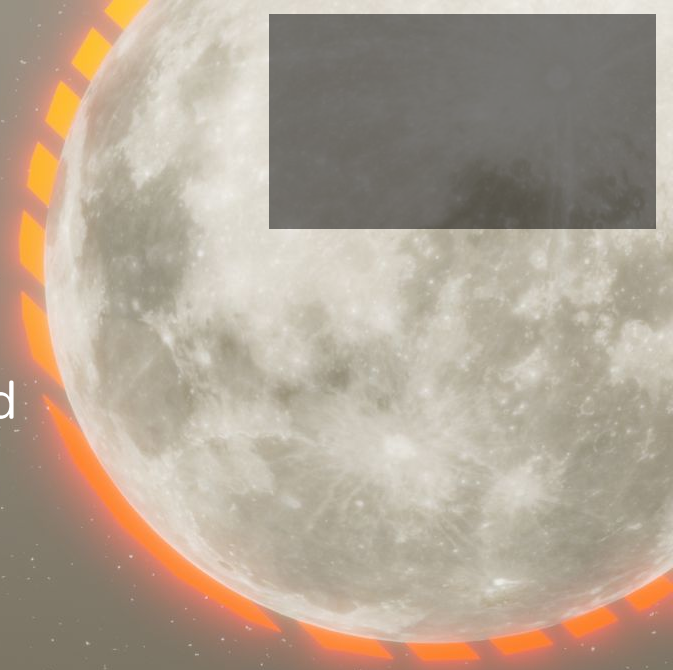


Argument 2

P1. If the Gospel is fundamentally based on flawed science, then it cannot be true.

P2. The Gospel is fundamentally based on flawed science.

C. Therefore the Gospel cannot be true.



Example Objection

Genetics has proven the Adam and Eve story in Genesis to be impossible. Without the Adam and Eve story, there would be no "Original Sin". Without Original Sin, there would be no need for Jesus. Without Jesus, the Christian religion falls apart completely.

The whole religion is based on and relies upon a story that could not possibly be true. All evidence points to this fact.

End Game.

Response 1: Denial of Inerrancy

~~P1. If the Gospel is fundamentally based on flawed science, then it cannot be true.~~

P2. The Gospel is fundamentally based on flawed science.

C. Therefore the Gospel cannot be true.

This is a live option; but may put you outside the evangelical pale.



Response 2: Is the Gospel based on flawed science?

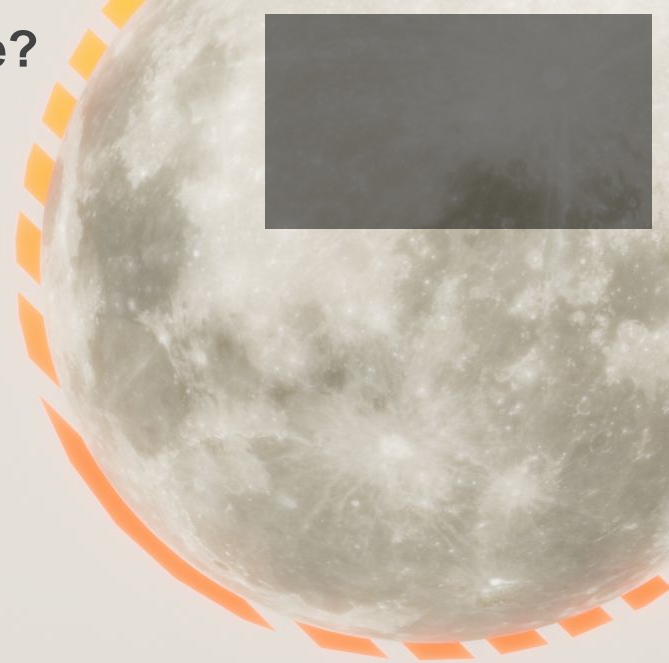
Addressing this argument involves address several important questions:

P1. If the Gospel is fundamentally based on flawed science, then it cannot be true.

P2. The Gospel is fundamentally based on flawed science.

C. Therefore the Gospel cannot be true.

What does the Bible actually teach?
What does Science actually show?



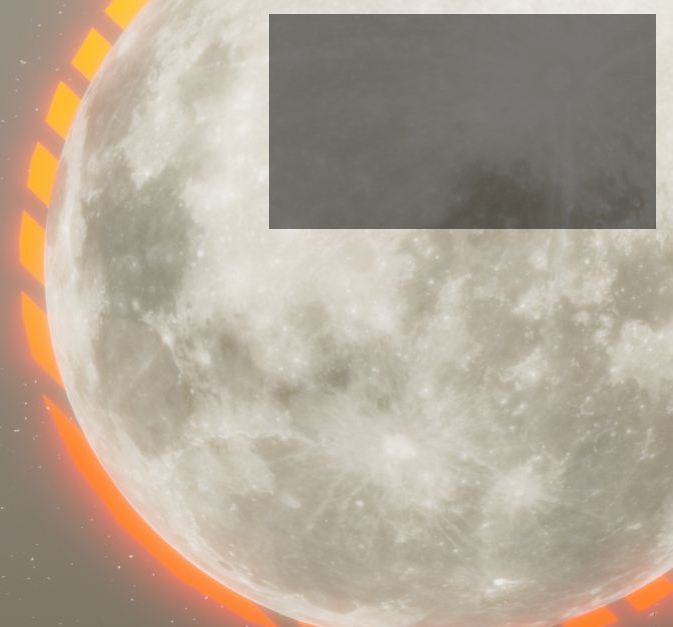
Summary of the Biblical Data

- Narrative account of Gen 2-4 defines the **literary** Adam, but the genre of mytho-history tempers any strong historical inferences
- Genealogies (Gen 5, Chr 1, Luke 3) indicate **historical** interest in Adam and **assert** Adam at the genealogical headwaters of humanity.
- Paul's incidental treatment of Adam in Acts 17 and 1 Cor 15 is most naturally interpreted as a **historical** person used **both illustratively** and **possibly assertively**.
- Paul **assertively** argues in Romans 5 that Adam's actions have impacted the world in a way that a mere literary character cannot.



Romans 5:12-19

... sin entered the world through one man [Adam], and death through sin... Death reigned from the time of Adam... even over those who did not sin by breaking a command, as did Adam, who is a pattern of the one to come [Jesus]... For if the many died by the trespass of the one man [Adam], how much more did God's grace and the gift that came by the grace of the one man, Jesus Christ, overflow to the many! ... For if, by the trespass of the one man [Adam], death reigned... how much more will those who receive God's abundant provision... through the one man, Jesus Christ!... just as one trespass resulted in condemnation for all people, so also one righteous act resulted in justification and life for all people. For just as through the disobedience of the one man [Adam] the many were made sinners, so also through the obedience of the one man [Jesus] the many will be made righteous.



Paul's argument
only works if
Adam was a real
person in
history!!!

Two Key Scientific Claims

1. Modern human beings (i.e. *homo sapiens*) share a common ancestor with other primates (e.g. chimpanzees).
2. The ancestral population of human beings has never been lower than a few thousand.
 - a. That is to say, the genetic diversity present in the human genome can not be accounted for if a genetic bottleneck of less than a few thousand members occurred in the past.



Different Models of Adam & Eve

Individual Biological* Ancestors:

- A&E were recently (< 10,000 ya) or anciently (100,000+ ya) created biological ancestors of the entire human race

Individual Representative-Ancestors:

- A&E were a divinely selected/created pair in a group of human ancestors to federally represent the human race

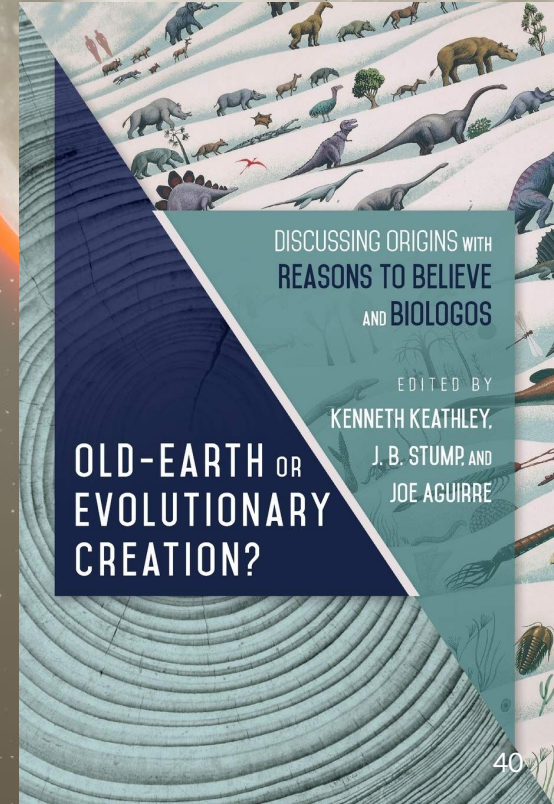
Group Representative-Ancestors:

- A&E were prominent members of a group selected by God for special divine revelation

Literary Representative Figures:

- God continually revealed Himself and dealt with humanity over a long period of time, but humanity continually rejected Him to pursue self-interest. A&E are a literary representation of that humanity's, Israel's, and our own rejection of God

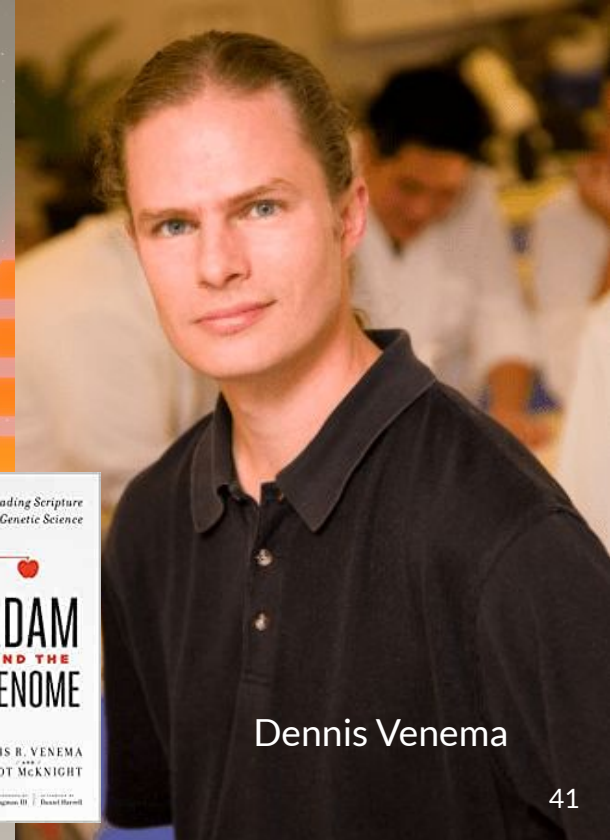
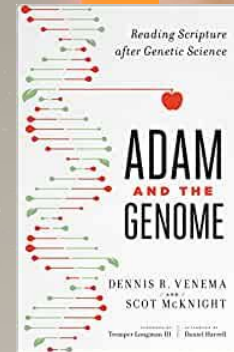
Ch. 3 of *Old Earth or Evolutionary Creation?* (2017, IVP Academic)



Adam and the Genome

As our methodology becomes more sophisticated and more data are examined, we will likely revise our estimates in the future. That said, we can be confident that finding evidence that we were created separately from other animals or that we descend only from two people just isn't going to happen. Some ideas in science are so well-supported that it is highly unlikely that new evidence will substantially modify them, and these are among them. **The sun is at the center of our solar system, humans evolved, and we evolved as a population.**

- Dennis Venema,
Adam and the Genome (2017), pg 55



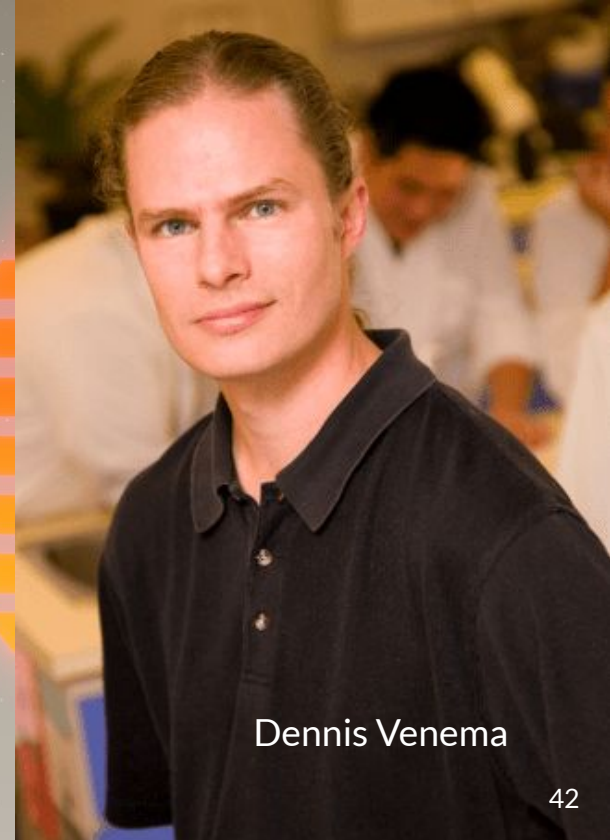
Dennis Venema

Evidence for Ancestral Population Sizes

Taken individually and collectively, population genomics studies strongly suggest that **our lineage has not experienced an extreme population bottleneck in the last nine million years** or more (and thus not in any hominid, nor even an australopithecine species), and that **any bottlenecks our lineage did experience were a reduction only to a population of several thousand breeding individuals**. As such, the hypothesis that humans are genetically derived from a single ancestral pair in the recent past has no support from a genomics perspective, and, indeed, is counter to a large body of evidence.

- Dennis Venema (2010)

Genesis and the Genome: Genomics Evidence for Human-Ape Common Ancestry and Ancestral Hominid Population Sizes.



Dennis Venema

Critique of Population Estimates

1. **Window Fallacy:** The population calculations are based on **averaged moving windows**, not individuals at a snapshot in time. Thus, the hypothesis of a genetic bottleneck of 2 hasn't actually been tested.
2. **Ecological Fallacy:** the data indicated that the **ancestral population** of *homo sapiens* on average never dipped below a few thousand, **NOT** that the population of *homo sapiens* never bottlenecked to two.
 - a. Consider the *homo sapien* population went to zero!
3. **"Genetic" Fallacy:** The proper question is not time to most recent common ancestor (TMRCA) of a DNA segment, but time to the most recent 4 alleles (TMR4A).
 - a. Assuming the genetic progenitors of the human race were both heterozygous
 - b. Lotsa math later, possible single pair bottleneck emerges at about **500 kya**



Venema's Concession

Based on some new simulations and some other published studies that we drew on, our group came to an agreement – that **if an event like this had happened, we would be able to detect it if it happened more recently than 500,000 years ago.** That was surprising to me, to be sure – I thought beforehand that an event like that would show up even further back in time. But population genetics isn't always intuitive, and we were torture-testing only one modeling approach. **Now, hear me well – there is no positive evidence at all that such an event occurred.** Moreover, there is no mechanism that I, nor Buggs, nor anyone else that I am aware of, has conceived of that could accomplish such an amazing feat. At 500,000 years ago, hominins are widespread over Africa and Asia.

- Dennis Venema (2019)

"Adam - Once More, With Feeling"

<https://www.patheos.com/blogs/jesuscreed/2019/11/04/adam-once-more-with-feeling/>



Dennis Venema

Evaluating Different Models of Adam & Eve

Individual Biological* Ancestors

- **Scripture:** Most natural reading of the text; some tensions with mysterious background characters
- **Science:** Possibly contradicted by population genetics.

Individual Representative-Ancestors

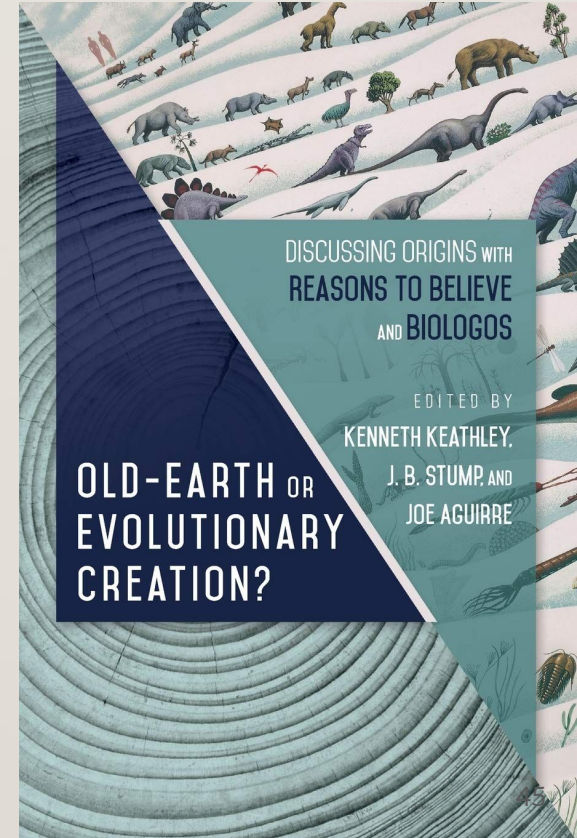
- **Scripture:** Resolves background character tension, fits with ANE structure
- **Science:** Compatible depending on timeline (recent/ancient)

Group Representative-Ancestors

- **Scripture:** No serious indication that God created a group in Eden
- **Science:** Compatible depending on timeline (recent/ancient)

Literary Representative Figures

- **Scripture:** Can literary characters bear weight of Paul's theology?
- **Science:** Makes no scientific claims.



Evaluating Different Models of Adam & Eve

Individual Biological* Ancestors

- **Science:** Possibly contradicted by population genetics.
 - Genealogical ancestry converges at 6kya, genetic ancestry at 500kya.
- **Scripture:** Most natural reading of the text; some tensions with mysterious background characters

Individual Representative-Ancestors

- **Science:** Compatible depending on timeline (recent/ancient)
 - 200kya has no problems, 6kya might
- **Scripture:** Resolves background character tension, fits with ANE structure

Group Representative-Ancestors

- **Science:** Compatible depending on timeline (recent/ancient)
 - 200kya has no problems, 6kya might
- **Scripture:** No serious indication that God created a group in Eden

Literary Representative Figures

- **Science:** Makes no scientific claims.
- **Scripture:** Can literary characters bear weight of Paul's theology?



Argument 2

P1. If the Gospel is fundamentally based on flawed science, then it cannot be true.

P2. The Gospel is fundamentally based on flawed science.

C. Therefore the Gospel cannot be true.

Response 2: Science does not rule out a literal Adam

***Response 1:
Deny Inerrancy***

Conclusion and Summary

Contemporary science is often presented as being in massive contradiction to the teaching of the Christian scriptures.

Three key areas of contention are:

1. **Cosmology**
2. **Biology**
3. **Anthropology**

I don't care what the Gospel teaches... it is based on incorrect ancient Science; Why should I believe what the Bible says about spiritual things if gets science so wrong?

Alvin the Atheist



Carol the Christian

Conclusion and Summary

1. The goal here is apologetics and evangelism, not systematic theology
2. We should not require a non-believer to accept to Biblical inerrancy prior to accepting the Gospel

First, maybe the Bible has wrong science? That does not mean the Gospel is not true!

Alvin the Atheist



Carol the Christian

Conclusion and Summary

1. Only the most extreme views are actually in contradiction with contemporary science
2. We should not require a non-believer to accept *prima facie* implausible beliefs (i.e. that the universe is 6k years old) before they accept Gospel
 - a. You won't win that argument, and even if you did, what have you accomplished?
3. There are many views of Genesis that do not produce scientific issues. You may not know which view is correct, but that is ok at this stage.

Second, there are many interpretations of Genesis, most of which are NOT in contradiction with science!

Alvin the Atheist



Carol the Christian

Official Ratio Christi Position

We believe in the ex-nihilo special creation of the universe and in the supernatural creation of many diverse biological categories. We also believe in the historicity of the biblical record, including the special creation of Adam and Eve (the first human male and female) as the literal progenitors of all humans.(3)

We do not require a position on the age of the universe. Genesis is to be interpreted in an accurate historical-grammatical-literary [sic] manner, but the time frames and sequence of origins are still debatable. We do not affirm theistic evolution (TE) as the best explanation of origins, yet acknowledge some Christians hold this position. We welcome TE advocates to take on non-leadership roles within RC. This facilitates dialog and partnership with TE adherents while acknowledging our differences. For more detail on TE go here (forthcoming webpage).



Views expressed are of the speaker or cited author(s) only and anything derivative of the above are not endorsed by Ratio Christi

Supporting Materials

Last fall we spent 3 meetings on these topics,
and have over 4 hours of content on YouTube

1. OT Controversy 2: How Should We Read Genesis 1-11?
 - a. https://www.youtube.com/watch?v=xhRrKgoA_JQ
2. OT Controversy 3: Does Genesis Contradict Science?
 - a. <https://www.youtube.com/watch?v=WBdmoWiS6Fw&t=4s>
3. OT Controversy 4: Does Genetic Evidence Contradict Adam and Eve?
 - a. https://www.youtube.com/watch?v=rIBw_Ve3OyU&t=1s



Ratio Christi
Texas A&M

Supporting Materials



THINK
THEISM

"Interview w/ Dr. Joshua Swamidass (Part 2)"

<http://rc-tamu.org/podcast/interview-w-dr-joshua-swamidass-part-2/>



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"Interview w/ Dr. Joshua Swamidass (Part 1)"

<http://rc-tamu.org/podcast/interview-w-dr-joshua-swamidass-part-1/>



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"Dr. Paul Nelson – Interview"

<http://rc-tamu.org/podcast/s2e6-dr-paul-nelson-interview/>



THINK
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"Darwinism Devolving – an interview w/ Dr. Michael Behe"

<http://rc-tamu.org/podcast/darwinism-devolving-an-interview-w-dr-michael-behe/>



THINK
THEISM

"The Genealogical Adam & Eve – an interview w/ Dr. Joshua Swamidass"

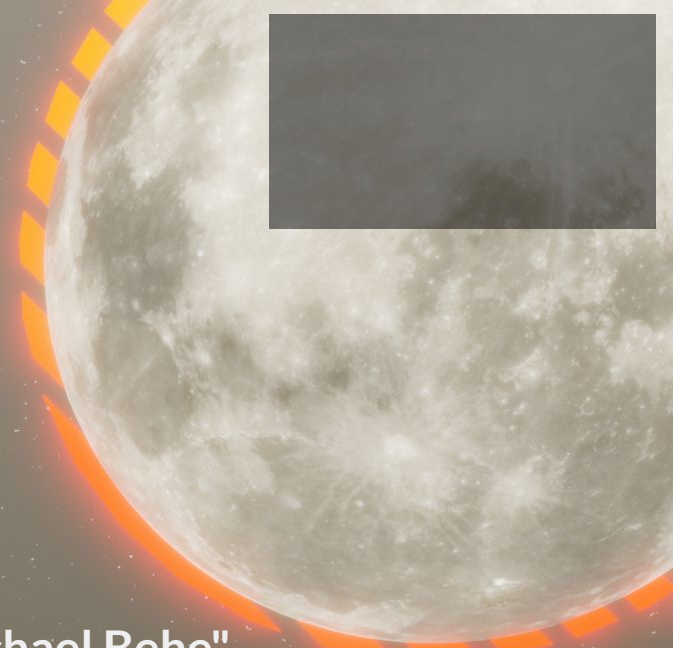
<http://rc-tamu.org/podcast/the-genealogical-adam-eve-an-interview-w-dr-joshua-swamidass/>



THINK
THEISM

"Evolution, Fine-Tuning, & Philosophy of Science, an interview w/ Dr. Joel Velasco"

<http://rc-tamu.org/podcast/evolution-fine-tuning-philosophy-of-science-an-interview-w-dr-joel-velasco/>



READING GENESIS WELL

*Navigating History, Poetry,
Science, and Truth in Genesis 1-11*

C. JOHN COLLINS

Navigating History, Poetry, Science, and Truth in Genesis 1-11

What does it mean to be a good reader of Genesis 1-11? What does it mean to take these ancient stories seriously and how does that relate to taking them literally? Can we even take any of this material seriously?

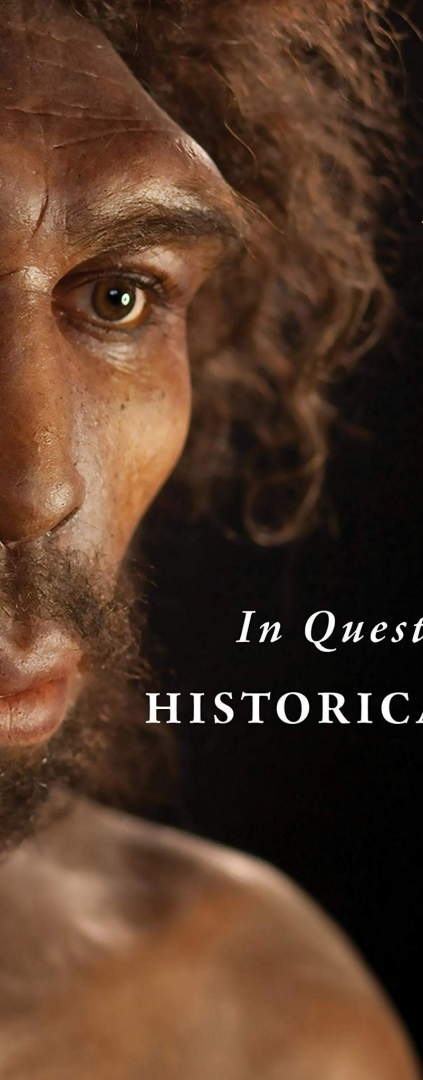
Reading Genesis Well answers these questions and more, promoting a responsible conversation about how science and biblical faith relate by developing a rigorous approach to interpreting the Bible, especially those texts that come into play in science and faith discussions. This unique approach connects the ancient writings of Genesis 1-11 with modern science in an honest and informed way.

Old Testament scholar C. John Collins appropriates literary and linguistic insights from C. S. Lewis and builds on them using ideas from modern linguistics, such as lexical semantics, discourse analysis, and sociolinguistics. This study helps readers to evaluate to what extent it is proper to say that the Bible writers held a "primitive" picture of the world, and what function their portrayal of the world and its contents had in shaping the community.



C. John Collins is Professor of Old Testament at Covenant Theological Seminary in St. Louis, Missouri. Collins served as Old Testament chair on the translation committee for the English Standard Version of the Bible, and Old Testament Editor for the ESV Study Bible. He has written extensively on biblical languages and interpretation, and on science and the Christian faith, including:

- *Did Adam and Eve Really Exist?: Who They Were and Why You Should Care*
- *The God of Miracles: An Exegetical Examination of God's Action in the World*
- *Science and Faith: Friends or Foes?*
- *Genesis 1-4: A Linguistic, Literary, and Theological Commentary*



WILLIAM
LANE
CRAIG

In Quest of the
HISTORICAL ADAM

*A Biblical
and
Scientific
Exploration*

Was Adam a real historical person? And if so, who was he and when did he live?

William Lane Craig sets out to answer these questions through a biblical and scientific investigation. He begins with an inquiry into the genre of Genesis 1–11, determining that it can most plausibly be classified as mytho-history—a narrative with both literary and historical value. He then moves into the New Testament, where he examines references to Adam in the words of Jesus and the writings of Paul, ultimately concluding that the entire Bible considers Adam the historical progenitor of the human race—a position that must therefore be accepted as a premise for Christians who take seriously the inspired truth of Scripture.



Working from that foundation of biblical truth, Craig embarks upon an interdisciplinary survey of scientific evidence to determine where Adam could be most plausibly located in the evolutionary history of humankind, ultimately determining that Adam lived between 750,000 and 1,000,000 years ago as a member of the archaic human species *Homo heidelbergensis*. He concludes by reflecting theologically on his findings and asking what all this might mean for us as human beings created in the image of God, literally descended from a common ancestor—albeit one who lived in the remote past

Recommended Resource: Defenders



William Lane Craig
reasonablefaith.org

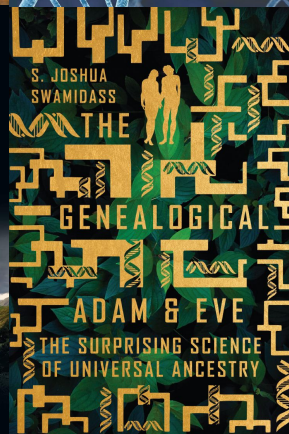
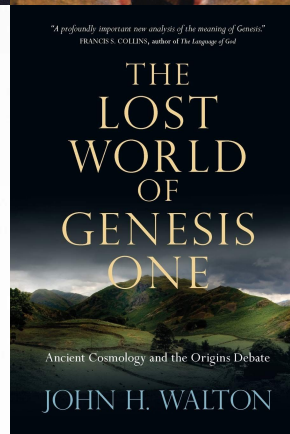
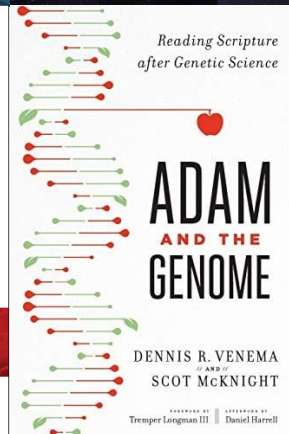
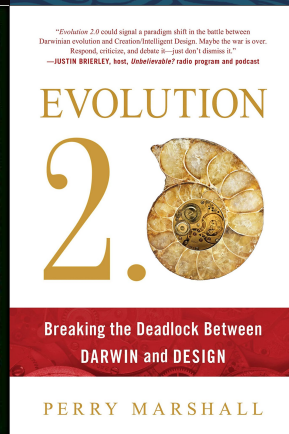
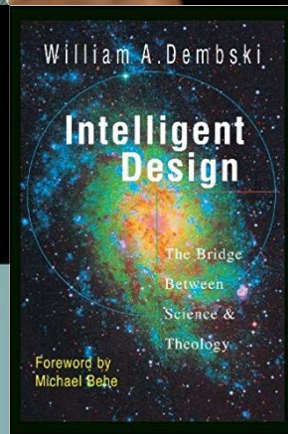
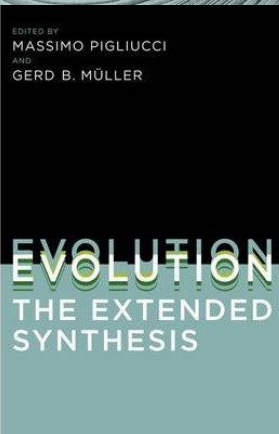
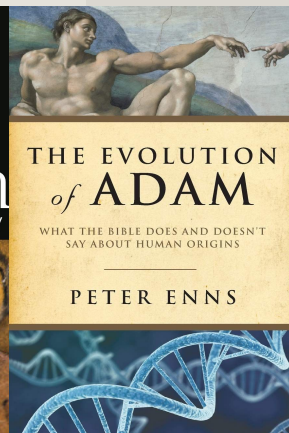
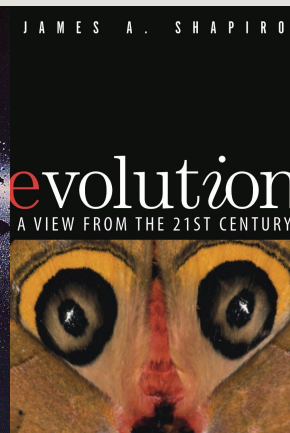
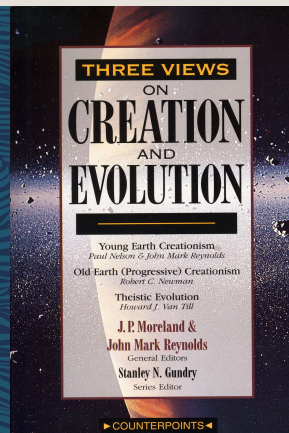
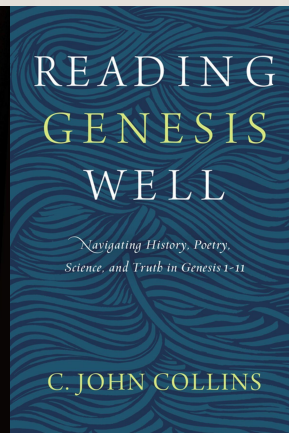
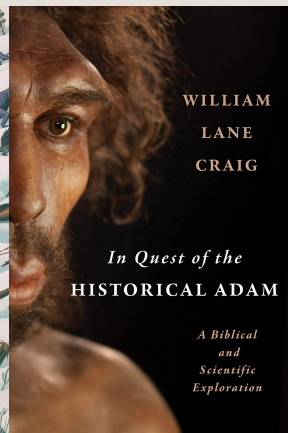
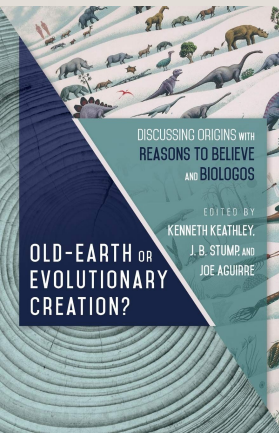
Defenders is Dr. William Lane Craig's Sunday School class on Christian doctrine and apologetics.

"Excursus On Creation Of Life And Biological Diversity" is a 35 episode segment that provides a nice summary of the interpretation of Genesis, science of evolution, and integration of all the data.



<https://www.reasonablefaith.org/podcasts/defenders-podcast-series-3/excursus-on-creation-of-life-and-biological-diversity/>

Further Reading



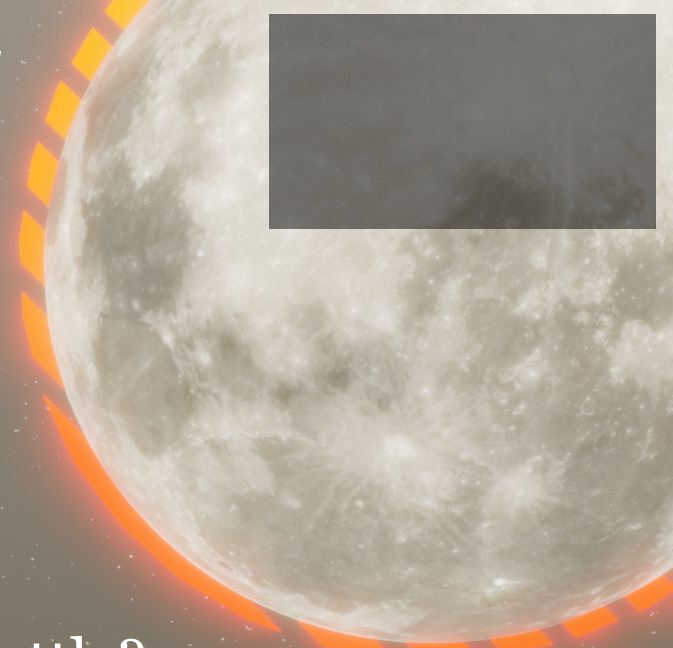
A digital landscape featuring a cyan wireframe mountain on the left, a purple wireframe horizon and ground grid, and a large orange and black striped sphere on the right against a starry background.

Genre, Myth, and ANE

GENRE *EXAMPLE*

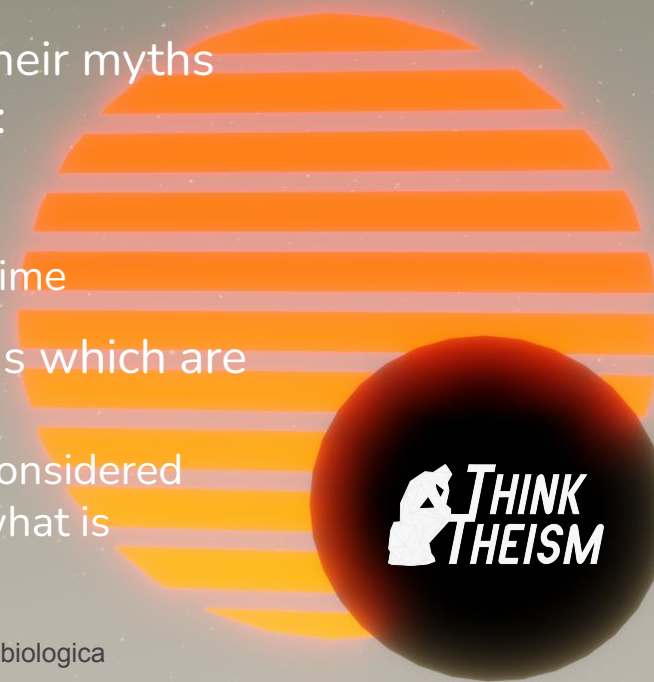
*From heaven the stars fought, from
— their courses they fought against
Sisera. – Judges 5:20*

- What is going on here? An interstellar battle?
- The surrounding verses clarify the genre here is Jewish poetic-structural narrative or perhaps Jewish apocalyptic language
- Judges 4 provides historical narrative of the same battle



How did ANE people understand their literature?

- **This is a very difficult question...**
 - We do not have access to ancient peoples to ask them
 - The writings are sparse enough that we don't really have early written interpretations of ANE myths
- We can instead study the way other cultures view their myths
- We can note two nearly universal features of myths:
 - **Flexibility:** The degree of variability over time
 - **Plasticity:** The degree of variability of a myth at one time
- Many cultures have “contradictory” versions of myths which are accepted
 - This suggests, that the contradictory details are not considered essential, but rather the central point of the myth is what is important



An Expert Opinion: Gordon Wenham

“Gordon Wenham, who is a highly respected Old Testament commentator, is instructive. Wenham is the author of the commentary Genesis 1-15 in The Word biblical commentary series. Of Jacobsen’s classification of Genesis 1-11 as mytho-history, Wenham remarks, “**This is a sensitive analysis of both texts.**” That is to say, both the Eridu Genesis and the biblical Genesis. “**But,**” and here comes the caveat, “**myth is a loaded term which leads to misunderstanding. That is why I prefer *proto-history*.**”

“The narratives put profound theological truths “in vivid and memorable form in an absorbing yet highly symbolic story.” If we take these stories as straightforward history, Wenham cautions, “we may be forced to conclude that Genesis is trying to relate history but not succeeding, which would be a rather negative conclusion.””

<https://www.reasonablefaith.org/podcasts/defenders-podcast-series-3/excursus-on-creation-of-life-and-biological-diversity/excursus-on-creation-of-life-and-biological-diversity-part-17/>



An Expert Opinion: Bill Arnold

By contrast, Bill Arnold is an evangelical Old Testament scholar at Asbury Seminary in Wilmington, Kentucky. Arnold has more temerity than Wenham. He opines

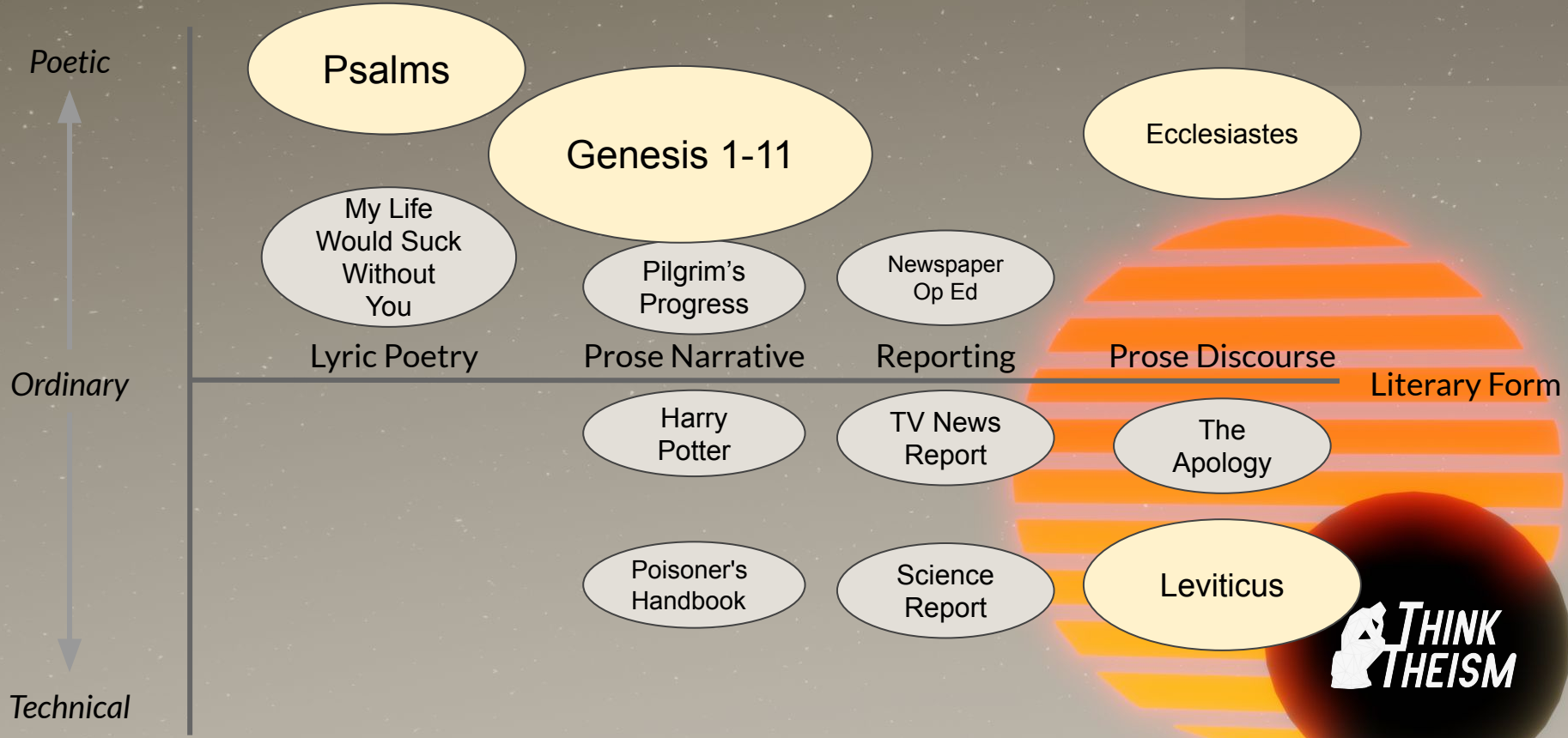
*“These chapters are no simple history or example of ancient historiography. At most, we may say that mythical themes have been arranged in a forward-moving, linear progression, in what may be considered a **historicizing literary form, using genealogies especially, to make history out of myth.**”*

“The Primeval History (Gen. 1-11) addresses the origins of the universe, the creation of humanity, and the first institutions of human civilization. We retain the term ‘history’ in the title of this first unit of the Bible—the Primeval History—because, on the one hand, it arranges themes along a time continuum using cause and effect and generally uses historical narrative as the literary medium for communication. On the other hand, those themes themselves are the same ones explored elsewhere in the ancient Near East in mythological literature... The Primeval History narrates those themes in a way that transforms their meaning and import, and for these reasons we may think of these chapters as a unique literary category, which some have termed ‘mytho-historical.’”

<https://www.reasonablefaith.org/podcasts/defenders-podcast-series-3/excursus-on-creation-of-life-and-biological-diversity/excursus-on-creation-of-life-and-biological-diversity-part-17/>



Literary Form vs. Language Type



**THINK
THEISM**

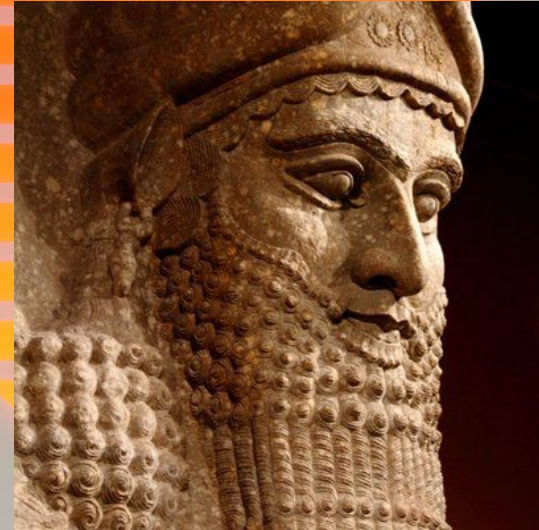
Exploring the Genre and the Shared World: Literature

We will look at three examples from Ancient Near Eastern (ANE) literature:

- Eridu Genesis
- The Atrahasis Epic
- The Sumerian King Lists

We will ask several questions:

1. How does Genesis compare to the literature from the ANE?
2. How did ANE people understand their literature?



Exploring the Shared World

Sumerian King List	Atrahasis Epic	Eridu Genesis	Genesis 1–11
1. Creation assumed; kingship came down from heaven	1. Creation assumed, gods create humans to do their work	1. Creation; cities are instituted	1. Creation (Gen 1–2)
2. Series of eight kings in five cities	2. Noisy humans alienate deities	2. [Alienation]	2. Alienation (Gen 3), genealogies (Gen 4–5)
3. The flood	3. The flood; ark	3. The flood; ark	3. The flood; ark (Gen 6–9)
4. Kingship again; dynasties follow, leading to— 5. “Modern times”	4. New start (5. “Modern times,” implied)	4. New start (5. “Modern times,” implied)	4. New start; then genealogies, down to— 5. “Modern times”



Eridu Genesis

Creation of Man:

When An, Enlil, Enki, and Ninhursaga fashioned dark-headed people, they had made the small animals that came up from out of the earth come from the earth in abundance. I had let there be, as befits it, gazelles, wild donkeys, four-footed beasts in the desert.

Judgement and the Flood:

And as Ziusudra stood there beside it, he went on hearing: "Step up to the wall to my left and listen! Let me speak a word to you at the wall and may you grasp what I say, may you heed my advice! **By our hand a flood will sweep over the cities of the half-bushel baskets, and the country; the decision, that mankind is to be destroyed, has been made.** A verdict, a command of the assembly, can not be revoked... All the evil winds, all stormy winds gathered into one and with them, them, **the Flood was sweeping over the cities of the half-bushel baskets, for seven days and seven nights.** After the flood had swept over the country, after the evil wind had tossed the **big boat** about on the great waters, the sun came out spreading light over heaven and earth.



Atrahasis

Creation of Man:

When the gods were man they did forced labor, they bore drudgery. Great indeed was the drudgery of the gods, the forced labor was heavy, the misery too much: the seven great Anunna-gods were burdening the Igigi-gods with forced labor. [Lacuna] The gods were digging watercourses, canals they opened, the life of the land. The Igigi-gods were digging watercourses canals they opened, the life of the land. The Igigi-gods dug the Tigris river and the Euphrates thereafter. Springs they opened from the depths, wells ... they established... They heaped up all the mountains. [Several lines missing]... years of drudgery... the vast marsh.

They counted years of drudgery, ... and forty years, too much! ... forced labor they bore night and day. They were complaining; denouncing, muttering down in the ditch: "Let us face up to our foreman the prefect, he must take off our heavy burden upon us! Enlil, counsellor of the gods, the warrior, come, let us remove him from his dwelling..."

They slaughtered Aw-ilu [a god], who had the inspiration, in their assembly. Nintu mixed clay with his flesh and blood... From the flesh of the god the spirit remained. It would make the living know its sign. Lest he be allowed to be forgotten, the spirit remained. After she had mixed the clay, she summoned the Anunna, the great gods. The Igigi, the great gods, spat upon the clay. Mami made ready to speak, and said to the great gods: "You ordered me the task and I have completed it! You have slaughtered the god, along with his inspiration. I have done away with your heavy forced labor, I have imposed your drudgery on man. You have bestowed clamor upon mankind. I have released the yoke, I have made restoration."

Atrahasis

Judgement and the Flood:

Atrahasis made ready to speak, and said to his lord: "Make me know the meaning of the dream. let me know, that I may look out for its consequence." Enki made ready to speak, and said to his servant: "...**Flee the house, build a boat, forsake possessions, and save life. The boat which you build... be equal ... Roof her over like the depth, so that the sun shall not see inside her. Let her be roofed over fore and aft. The gear should be very strong, the pitch should be firm, and so give the boat strength.** I will shower down upon you later a windfall of birds, a spate of fishes." **He opened the water clock and filled it, he told it of the coming of the seven-day deluge...**

The Elders ... The carpenter carried his axe, the reedworker carried his stone, the rich man carried the pitch, the poor man brought the materials needed. whatever he had ... Whatever he had ... **Pure animals he slaughtered; cattle ... Fat animals he killed. Sheep ... he choose and and brought on board. The birds flying in the heavens, the cattle and the ... of the cattle god, the creatures of the steppe, ... he brought on board... he invited his people... to a feast... his family was brought on board...**

The outlook of the weather changed. Adad began to roar in the clouds. The god they heard, his clamor. He brought pitch to seal his door. By the time he had bolted his door, Adad was roaring in the clouds. The winds were furious as he set forth, He cut the mooring rope and released the boat. the storm... were yoked Anzu rent the sky with his talons, He ... the land and broke its clamor like a pot... the flood came forth. Its power came upon the peoples like a battle, one person did not see another, they could not recognize each other in the catastrophe. The deluge bellowed like a bull, The wind resounded like a screaming eagle. The darkness was dense, the sun was gone,... like flies... the clamor of the deluge.



Atrahasis

Limits on life and population:

Enki made ready to speak and said to Nintu the birth goddess: "You, birth goddess, creatress of destinies, establish death for all peoples! "Now then, let there be a third woman among the people, among the people are the woman who has borne and the woman who has not borne. Let there be also among the people the pasittu (she-demon): Let her snatch the baby from the lap who bore it. And establish high priestesses and priestesses, let them be taboo,note and so cut down childbirth."

NOTE: "Scholars now agree that damaged text near the end of the Epic refers to the gods' decision to institute death as a normal end to human life; the restoration is supported by a newly discovered piece of Sumerian text. This late decision rectified the mistake the gods made in the initial creation of man."

Collins, C. John. Reading Genesis Well (p. 118). Zondervan Academic. Kindle Edition.

Robert Longacre, "The Discourse Structure of the Flood Narrative," in Society of Biblical Literature 1976 Seminar Papers, ed. G. MacRae (Missoula, MT: Scholars Press, 1976), 235–62. See also Robert Longacre, "Interpreting Biblical Stories," in Discourse and Literature, ed. Teun A. van Dijk (Amsterdam/Philadelphia: John Benjamins, 1985), 169–85.



Atrahasis

“The story opens at the time “when the gods instead of man did the work, bore the loads”; because the work was too hard, “the great Anunnaki,” the (senior) gods, made the Igigi, a group of “junior” gods, to do the work (such as digging canals). When the Igigi objected to the work and went on strike, the gods decided not to destroy them for rebellion but instead to decree the formation of humankind who would then do the hard work. The gods slew one of their number and mixed his blood and flesh with clay and their spittle to make humankind in seven couples (without setting a limit on their life spans). Unfortunately, humankind was a noisy lot whose population grew and spread, which disturbed the gods’ rest and tranquility. The gods sent plague and famine to control the population and finally resorted to a great flood. Certain of the gods secretly spared Atrahasis, who made a special boat and saved animals and some people (the text is damaged, so the details are uncertain).”

Collins, C. John. Reading Genesis Well (p. 118). Zondervan Academic. Kindle Edition.



The Sumerian King List (Late 3rd millennium BCE)

After the kingship descended from heaven, the kingship was in Eridu. In Eridu, Alulim became king; he ruled for 28,800 years. Alagar ruled for 36,000 years. Two kings; they ruled for 64,800 years.

Then Eridu fell and the kingship was taken to Bad-tibira. In Bad-tibira, Enmen-lu-ana ruled for 43,200 years. Enmen-gal-ana ruled for 28,800 years. The divine Dumuzi, the shepherd, ruled for 36,000 years. Three kings; they ruled for 108,000 years.

Then Bad-tibira fell and the kingship was taken to Larak. In Larak, En-sipad-zid-ana ruled for 28,800 years. One king; he ruled for 28,800 years.

Then Larak fell and the kingship was taken to Sippar. In Sippar, Enmen-dur-ana became king; he ruled for 21,000 years. One king; he ruled for 21,000 years.

Then Sippar fell and the kingship was taken to Šuruppak. In Šuruppak, Ubara-Tutu became king; he ruled for 18,600 years. One king; he ruled for 18,600 years.

Five cities; eight kings ruled for 385,200 [sic] years. Then the Flood swept over.

After the Flood had swept over, and the kingship had descended from heaven, the kingship was in Kiš. In Kiš, Gišur became king; he ruled for 1,200 years. Kullassina-bêl ruled for 900 years. Nan-GiŠ-lišma ruled for 1,200 years. En-dara-ana ruled for 420 years, 3 months, and 3½ days. Babum ruled for 300 years. Pu'annum ruled for 840 years. Kalibum ruled for 900 years. Kalumum ruled for 840 years. Zuqaqip ruled for 900 years. Atab ruled for 600 years. Mašda, son of Atab, ruled for 840 years. Arwi'um, son of Mašda, ruled for 720 years. Etana, the shepherd, who ascended to heaven and put all countries in order, became king; he ruled for 1,500 years. Balih, son of Etana, ruled for 400 years. Enme-nuna ruled for 660 years. Melem-Kiš, son of Enme-nuna, ruled for 900 years. Barsal-nuna, son of Enme-nuna, ruled for 1,200 years. Samug, son of Barsal-nuna, ruled for 140 years. Tizkar, son of Samug, ruled for 305 years. Ilku'u ruled for 900 years. Ilta-sadum ruled for 1200 years. Enmen-baragesi, who destroyed Elam's weapons, became king; he ruled for 900 years. Agga, son of Enmen-baragesi, ruled for 625 years. Twenty-three kings ruled for 23,310 years, 3 months, and 3 1/2 days.



What do Other Ancient Near Eastern Texts Look Like?

1. Creation
 - a. Enuma Elish
 - b. Atrahasis
2. The Fall
 - a. Gilgamesh loses plant of rejuvenation to serpent
 - b. Aqhat refuses eternal life
3. The Flood
 - a. Atrahasis + Gilgamesh, and Sumerian flood (Eridu Genesis)
 - b. Noah and the Flood
4. Genealogies
 - a. Sumerian King Lists
 - b. Babylonian/Ur



How does Genesis compare to the literature from the ANE?

Differences:

1. Lack of gods...
2. Genesis is less fantastic
3. Radically different theology

Similarities:

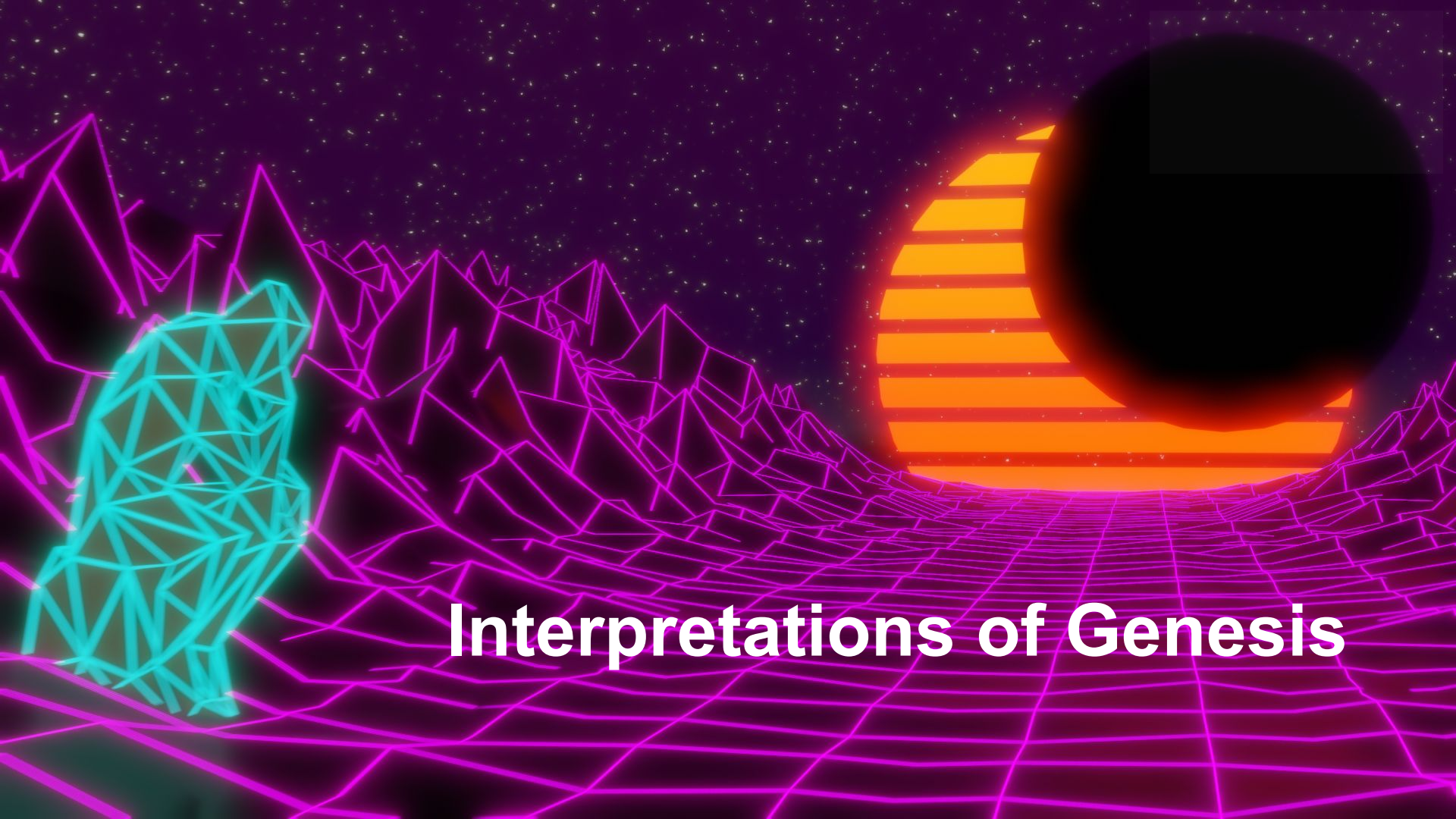
1. “Fantastic” elements (i.e. talking serpent, cherubim)
2. A similar interest in grounding present realities in the primordial past
3. Similar episodes to those in ANE myths (Flood, molding man out of clay/dirt)
4. Genesis shows a similar interest in tying Mythic elements to *real historic people* using genealogies



Further reading/watching/listening

1. John C. Collins. *Reading Genesis Well*
2. William Lane Craig. *Defenders Podcast Series 3: Excursus on Creation of life and biological diversity*
3. Crash Course Mythology.
<https://youtu.be/HeX6CX5LEj0>
4. The Bible Project. Genesis CH1-11.
<https://youtu.be/GQI72THyO5I>
5. The Bible Project. Genesis part 1.
<https://youtu.be/KOUV7mWDI34>
6. The Bible Project. How to Read the Bible: Literary Styles. <https://youtu.be/oUXJ8Owes8E>





Interpretations of Genesis

Genesis 1:1-2:3a (ISV)

In the beginning, God created the universe. When the earth was as yet unformed and desolate, with the surface of the ocean depths shrouded in darkness, and while the Spirit of God was hovering over the surface of the waters, God said, “Let there be light!” So there was light.

God saw that the light was beautiful. He separated the light from the darkness, calling the light “day,” and the darkness “night.” The twilight and the dawn were day one.

Then God said, “Let there be a canopy between bodies of water, separating bodies of water from bodies of water!” So God made a canopy that separated the water beneath the canopy from the water above it. And that is what happened: God called the canopy “sky.” The twilight and the dawn were the second day.

Then God said, “Let the water beneath the sky come together into one area, and let dry ground appear!” And that is what happened: God called the dry ground “land,” and he called the water that had come together “oceans.” And God saw how good it was.

Then God said, “Let vegetation sprout all over the earth, including seed-bearing plants and fruit trees, each kind containing its own seed!” And that is what happened: Vegetation sprouted all over the earth, including seed-bearing plants and fruit trees, each kind containing its own seed. And God saw that it was good. The twilight and the dawn were the third day.

Then God said, “Let there be lights across the sky to distinguish day from night, to act as signs for seasons, days, and years, to serve as lights in the sky, and to shine on the earth!” And that is what happened: God fashioned two great lights—the larger light to shine during the day and the smaller light to shine during the night—as well as stars. God placed them in space to shine on the earth, to differentiate between day and night, and to distinguish light from darkness. And God saw how good it was. The twilight and the dawn were the fourth day.

Then God said, “Let the oceans swarm with living creatures, and let flying creatures soar above the earth throughout the sky!” So God created every kind of magnificent marine creature, every kind of living marine crawler with which the waters swarmed, and every kind of flying creature. And God saw how good it was.

God blessed them by saying, “Be fruitful, multiply, and fill the oceans. Let the birds multiply throughout the earth!” The twilight and the dawn were the fifth day.

Then God said, “Let the earth bring forth each kind of living creature, each kind of livestock and crawling thing, and each kind of earth’s animals!” And that is what happened: God made each kind of the earth’s animals, along with every kind of livestock and crawling thing. And God saw how good it was.

Then God said, “Let us make mankind in our image, to be like us. Let them be masters over the fish in the ocean, the birds that fly, the livestock, everything that crawls on the earth, and over the earth itself!”

So God created mankind in his own image;
in his own image God created them;
he created them male and female.

God blessed the humans by saying to them, “Be fruitful, multiply, fill the earth, and subdue it! Be masters over the fish in the ocean, the birds that fly, and every living thing that crawls on the earth!”

God also told them, “Look! I have given you every seed-bearing plant that grows throughout the earth, along with every tree that grows seed-bearing fruit. They will produce your food. I have given all green plants as food for every wild animal of the earth, every bird that flies, and to every living thing that crawls on the earth.” And that is what happened.

Now God saw all that he had made, and indeed, it was very good! The twilight and the dawn were the sixth day.

With this, the universe was completed, including all of its vast array. By the seventh day, God had completed the work he had been doing, so on the seventh day he stopped working on everything that he had done. Then God blessed the seventh day and made it holy, because on it God stopped working on everything that he had been creating.

Historic views on Genesis

- Papias of Hierapolis (disciple of John)
 - Hexaemeron of Anastasius Sinaita (961):
Viewed paradise in Genesis as image of the Church
 - Eusebius and Jerome tend to be against this suggestion.
- Records shows there are lost hexaemera (pg. 36 footnote)
- Theophilus :
 - Creatio ex Nihilo. mostly literal, but some allegorization.
- Origin
 - Gen 1 refers to creation of spiritual man, gen 2 refers to creation of man's body
- Hippolytus



Hebrew Myth (Egyptian?)

- This is the most controversial, and most unfamiliar
- Consider Miller and Soden
 - Trained at DTS
- Argue that genesis author used forms and genre from Egyptian mythology
- Thus, the chronology is non-literal, but the story is designed to convey theological truths
- Puts Genesis into context with ANE literature
- Similar to Egyptian polemic views

“A fresh and harmonious perspective on an issue of vital importance.”
—PHILIP YANCEY, best-selling author

IN THE BEGINNING... WE MISUNDERSTOOD

*Interpreting Genesis 1
in Its Original Context*



JOHNNY V. MILLER | JOHN M. SODEN

Hebrew Myth

- However, parallels to Egyptian creation stories are weak
 - There is no single Egyptian creation story
 - Surface parallels might be wrong

- But what if it is not about rehashing Egyptian mythology?

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IN THE BEGINNING... WE MISUNDERSTOOD

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Literalistic Calendar Day (144 hr) Interpretations

Assumptions

1. Days of Genesis 1 are
 - a. Literal ("yom")
 - b. 24 hours long
 - c. Sequential
 - d. Occurred at the beginning of creation
2. Genealogies of Genesis 5ff. are
 - a. Literal
 - b. Complete
 - c. Include literal ages of people
 - d. Not telescoped

Following the LXX, the universe is
7510 ± 63.6 years old

Following the MT, the universe is
5974 ± 115.2 years old

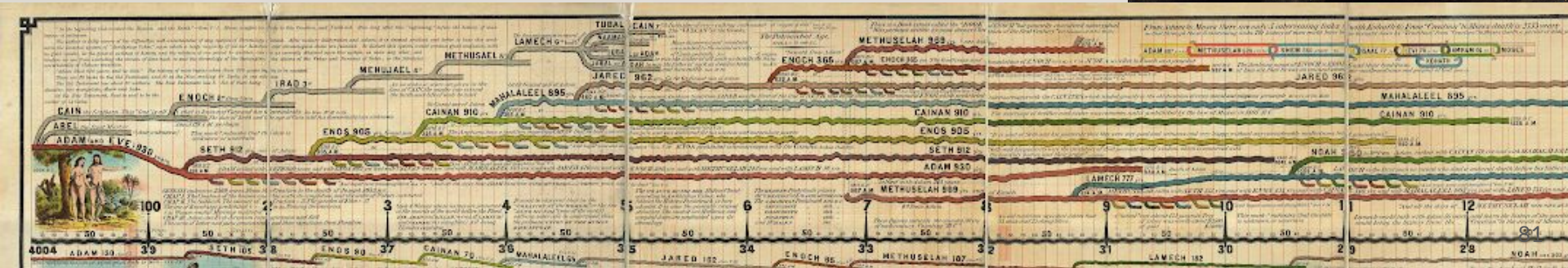
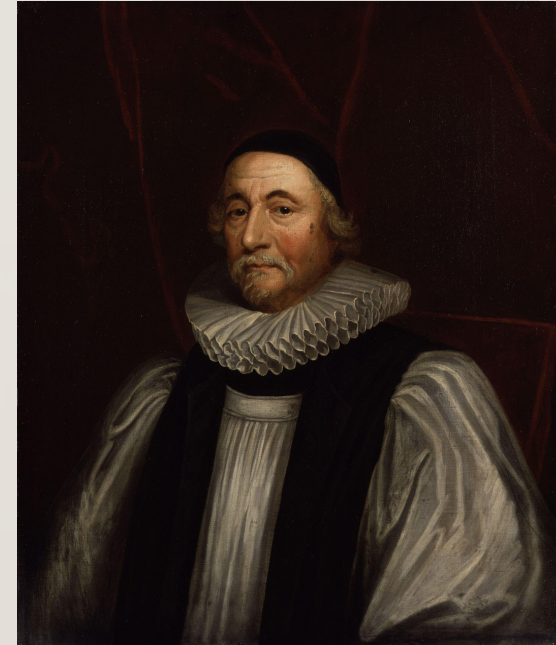


How do we interpret the days? Literally!

Bishop James Ussher (1625-1656) compiled a chronology of the world based on the Genesis text putting the date of creation on **October 23, 4004 BC**. This interpretation assumes literal consecutive days of creation and literal exhaustive genealogies throughout the Tanakh and uses the Masoretic Text.

Calculations using the LXX: Clement of Alexandria (552 BC), Theophilus of Antioch (552 BC), Sextus Julius Africanus (550 BC), Hippolytus of Rome (550 BC), Gregory of Tours (550 BC), Panodorus of Alexandria (549 BC), Maximus the Confessor (549 BC), George Syncellus (549 BC), Sulpicius Severus (549 BC) and Isidore of Seville (533 BC).

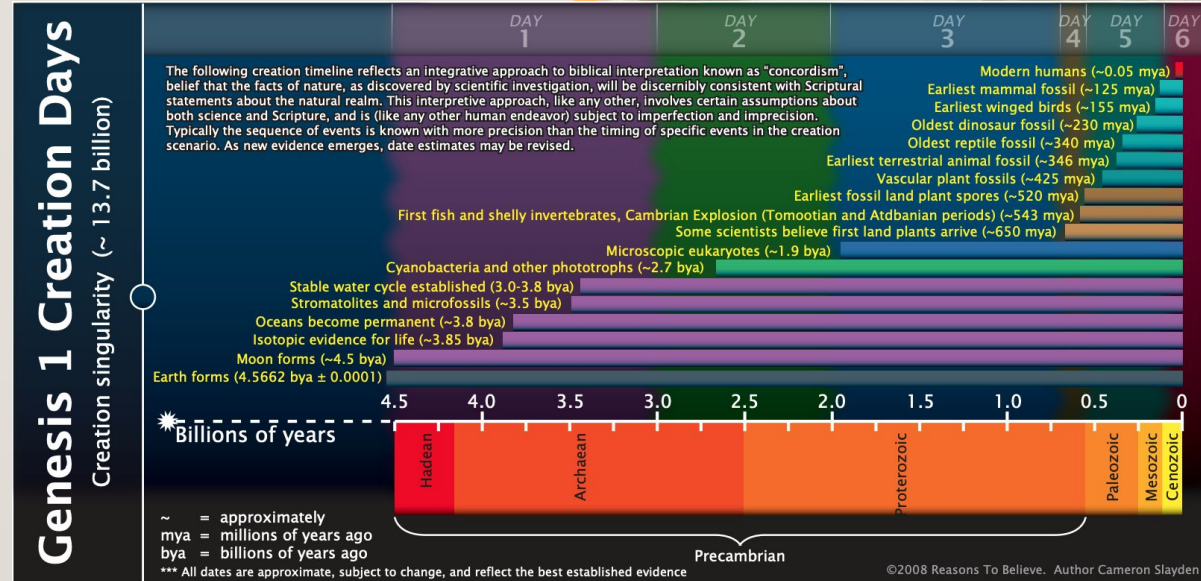
Calculations using the MT: Marianus Scotus (4192 BC), Henry Fynes Clinton (4138 BC), Maimonides (4058 BC), Henri Spondanus (4051 BC), Benedict Pereira (4021 BC), Louis Cappel (4005 BC), James Ussher (4004 BC), Augustin Calmet (4002 BC), Isaac Newton (4000 BC), Petavius (3984 BC), Theodore Bibliander (3980 BC), Johannes Kepler (April 27, 3977 BC), Heinrich Bünting (3967 BC), Christen Sørensen Longomontanus (3966 BC), Melancthon (3964 BC), Martin Luther (3961 BC), Cornelius Cornelii a Lapide (3961 BC), John Lightfoot (3960 BC), Joseph Justus Scaliger (3949 BC), Christoph Helvig (3947 BC), Gerardus Mercator (3928 BC), Matthieu Brouard (3927 BC), Benito Arias Montano (3849 BC), Andreas Helwig (3836 BC), David Gans (3761 BC), Gershom ben Judah (3754 BC) and Yom-Tov Lipmann Heller (3616 BC).



Day-Age Interpretations

Assumptions

1. Days of Genesis 1 are
 - a. Literal ("yom")*
 - b. Indefinitely long
 - c. Sequential
 - d. Occurred at the beginning of creation
2. Genealogies of Genesis 5ff. are
 - a. Mostly literal
 - b. Probably telescoped
 - c. May or may not include literal ages of people



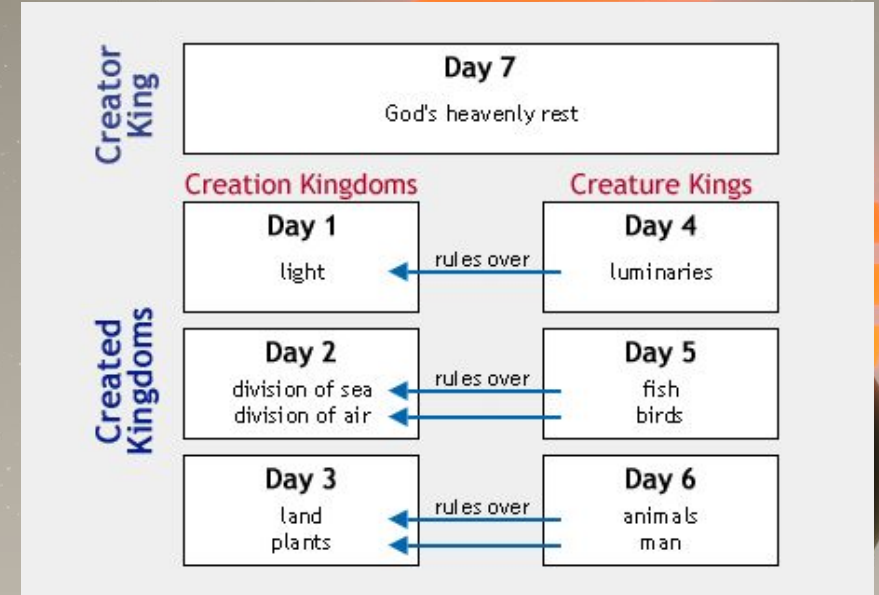
Example of one version of the day-age view from Hugh Ross's group "Reasons to Believe" (reasons.org)

* Interpretive note: the Hebrew term *yom* used for "day" has the same interpretive elasticity as the English "day". Day-age take *yom* in the sense of "in the day of Abraham Lincoln...", i.e. an era of unspecified length.

Temporally Agnostic Views

Assumptions

1. Days of Genesis 1
 - a. Mostly non-literal, literary constructs
 - b. Assessing "length" is meaningless
 - c. Mostly non-sequential
2. Genealogies of Genesis 5ff.
 - a. May or may not be literal
 - b. May or may telescoped
 - c. May or may not include literal ages of people



Example of Henri Blocher's version of the framework interpretation.
<https://thenaturalhistorian.com/>

Age of the Earth/Universe

Biblical Data

How do we interpret the days of Genesis 1?

- Literalistic
 - Literalistic Sequential Calendar Days (aka 144 hr View)
- Literal, redefining 'yom'
 - Day-Age
- Time Agnostic Views
 - Literary Framework
 - Analogical Days
 - Temple Inauguration

Scientific Data

How do we interpret radiometric dating, distant starlight, etc.?





Scientific Evidences
COSMOLOGY/GEOLOGY

Age of the Earth/Universe

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 - Temple Inauguration

Scientific Data

How do we interpret radiometric dating, distant starlight, etc.?

- Radiometric data
- Cosmic microwave background (CMB) radiation
- Distant starlight



**THINK
THEISM**

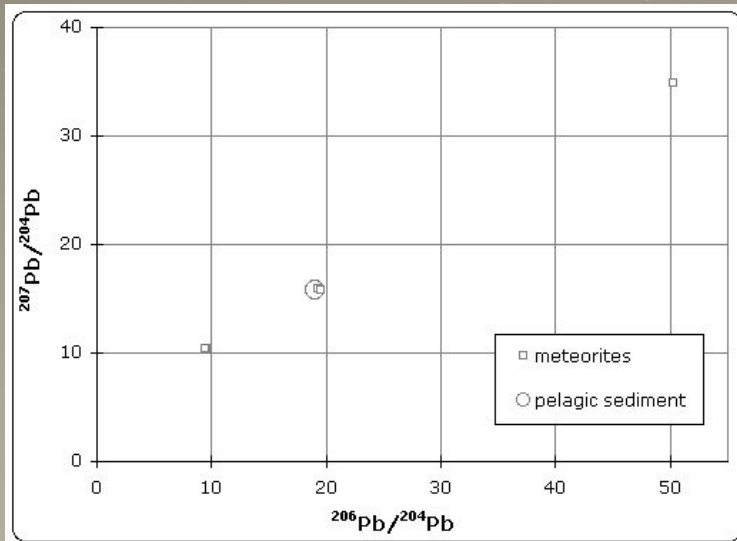
How do we determine the age of the Earth/Universe

Radiometric dating methods

- Uranium-lead
- Samarium-neodymium
- Potassium-argon
- Rubidium-strontium
- Uranium-thorium
- Lanthanum-barium (La-Ba)
- Radiocarbon
- Fission track
- Chlorine-36
- Luminescence
- Argon-argon (Ar-Ar)
- Iodine-xenon (I-Xe)

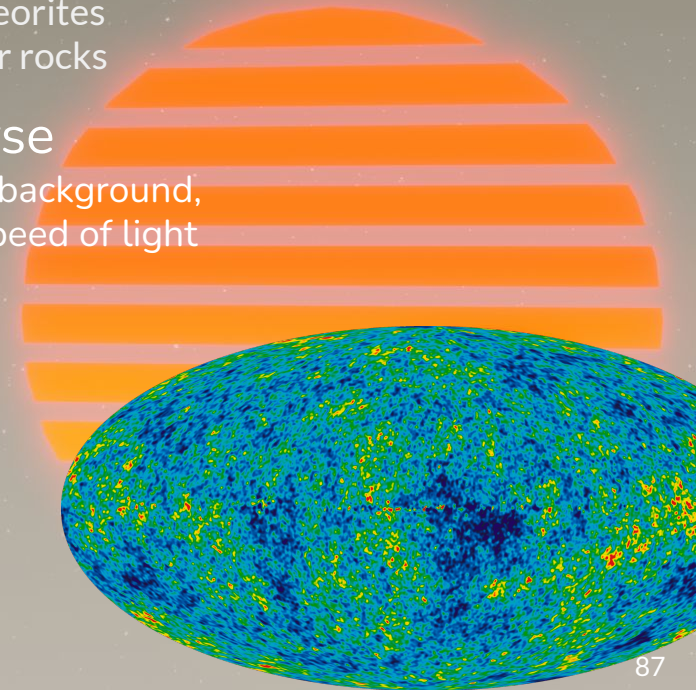
Radiometric dating sources

- terrestrial rocks
- meteorites
- lunar rocks

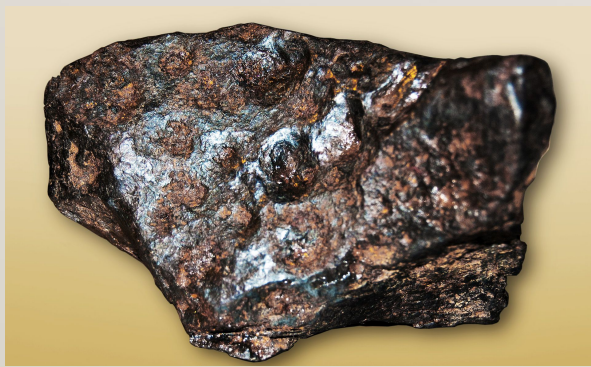


Age of the Universe

- Cosmic microwave background,
- Distant objects + speed of light

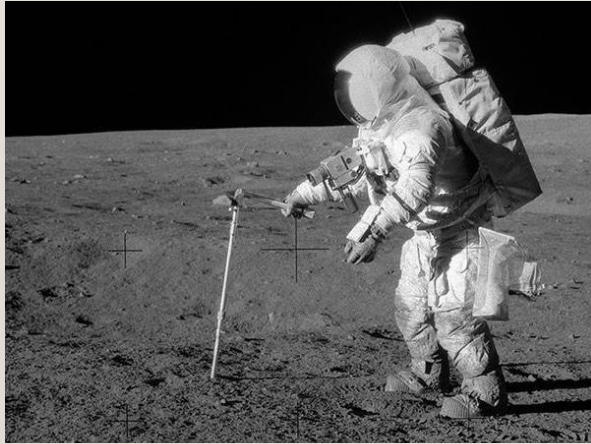


What is age of the Earth? - Canyon Diablo Meteorite



The solidification period (or the melting and fractionating) of meteoritic matter may be determined from the concentrations of long-lived isotopes and stable disintegration products. The most widely used isotopes for this purpose are U^{238}/Pb^{208} or Pb^{207}/Pb^{206} ($T_{1/2}$ for $U^{238} = 4.5 \times 10^9$ yr), Rb^{87}/Sr^{87} ($T_{1/2} = 6.2 \times 10^{10}$ yr), Re^{187}/Os^{187} ($T_{1/2} = 5 \times 10^{10}$ yr). **The duration of solidification, determined by different methods, is generally accepted to be from 4.4 to 5.0×10^9 yr. This epoch is comparable to the age of the Earth.**

What is age of the Earth? - Lunar Rocks

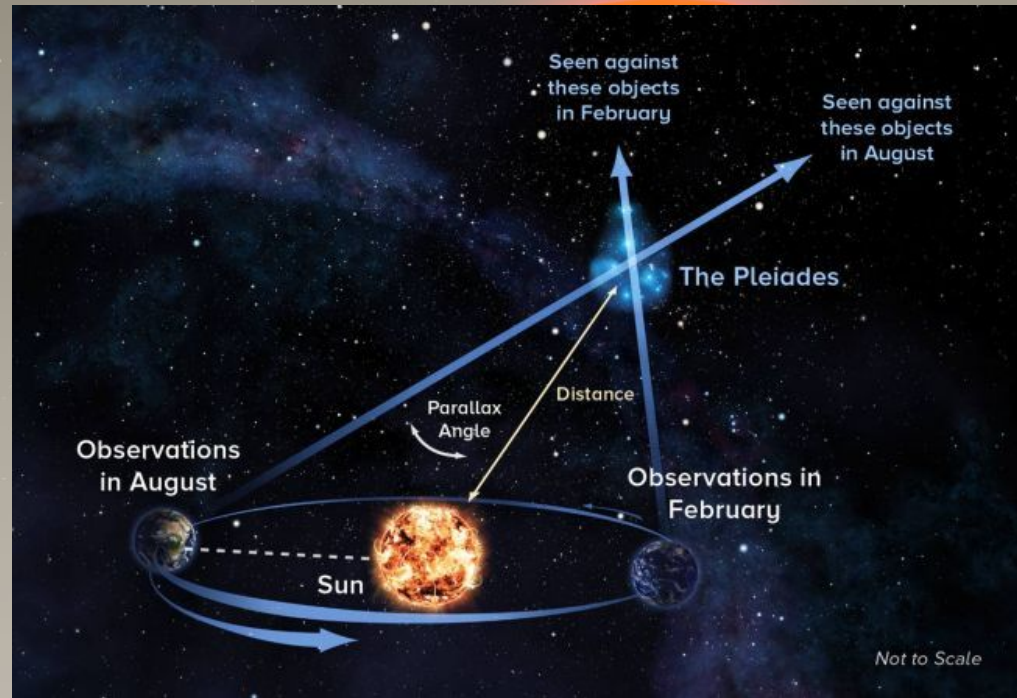


Establishing the age of the Moon is critical to understanding solar system evolution and the formation of rocky planets, including Earth. We present uranium-lead dating of Apollo 14 zircon fragments that yield highly precise, concordant ages, demonstrating that they are robust against postcrystallization isotopic disturbances. Hafnium isotopic analyses of the same fragments show extremely low initial $^{176}\text{Hf}/^{177}\text{Hf}$ ratios corrected for cosmic ray exposure that are near the solar system initial value. Our data indicate differentiation of the **lunar crust by 4.51 billion years, indicating the formation of the Moon within the first ~60 million years after the birth of the solar system.**

What is the age of the universe? Distant Stars

- Distances to stars in space are determined by a series of calculations called the "cosmic distance ladder".
- One of the calculations that has been used since ~200 B.C. is the stellar parallax (see right).
- Once distance is known, dividing by the speed of light (299,792,458 m/s) yields the age of the visible object.
- The light from the furthest visible star is estimated to be **about 9bn years old**.

Image and parallax explanation at <https://www.space.com/30417-parallax.html>



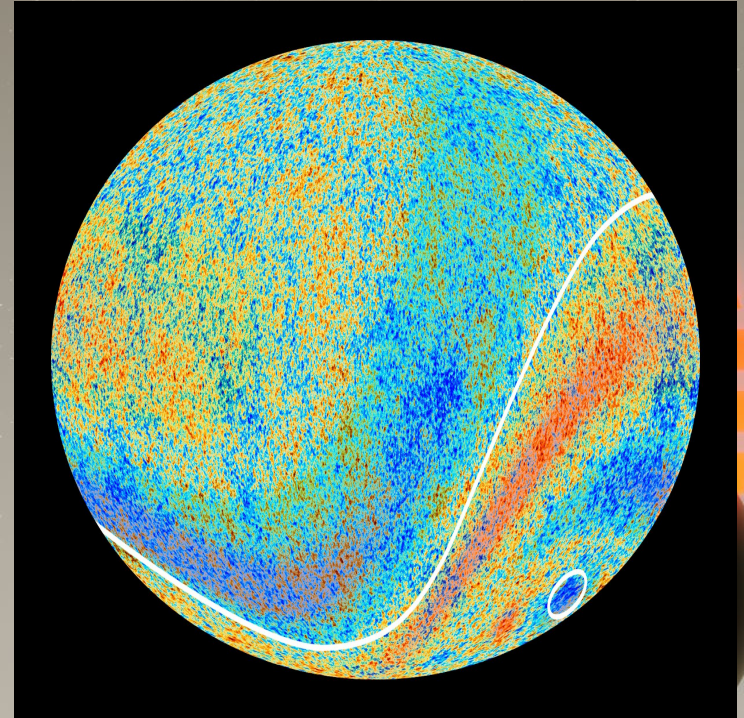
Kelly, P. L., et al. (2018). Extreme magnification of an individual star at redshift 1.5 by a galaxy-cluster lens. *Nature Astronomy*, 2(4), 334-342.

Hille, Karl. "Hubble Uncovers the Farthest Star Ever Seen." NASA, NASA, 2 Apr. 2018, www.nasa.gov/feature/goddard/2018/hubble-uncovers-the-farthest-star-ever-seen.

What is the age of the universe?

13.787 ± 0.020 billion years within the Λ CDM concordance model.

[We] conclude that the 6-parameter Λ CDM model provides an astonishingly accurate description of the Universe from times prior to 380,000 years after the Big Bang, defining the last-scattering surface observed via the CMB, to the present day at an age of 13.8 billion years.



Summary: How Old is the Earth/Universe?

Biblical Data

Literalistic Sequential Calendar
Days (aka 144 hr View)

~10,000 years (Earth + Universe)

Day-Age/Time Agnostic Views

N/A

Scientific Data

Radiometric dating

~4.5 billion years (Earth)

Cosmic microwave background
radiation

~13.8 bya (Universe)

Open-Handed Agnosticism

“Natural science at the moment seems to overwhelmingly point to an old cosmos. Though creationist scientists have suggested some evidences for a recent cosmos, none are widely accepted as true. It is safe to say that most recent [i.e. young-earth] creationists are motivated by religious concerns.”

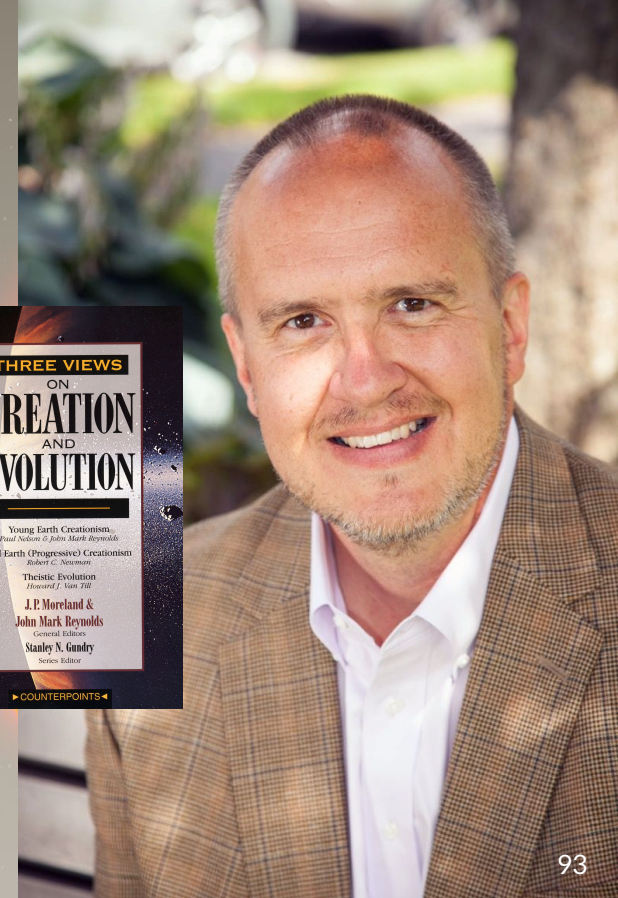
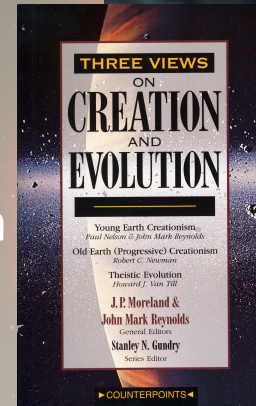
- Dr. Paul Nelson

“The Case for Young-Earth Creationism” in *Three views on Creation and Evolution* (1999, Zondervan)



“Think Theism Paul Nelson Interview”

<http://rc-tamu.org/podcast/s2e6-dr-paul-nelson-interview/>



Appearance of Age

The cosmos certainly appears old, but only merely appears old because God created it to look old.

OBJECTION: This makes God a LIAR!!!! r e e e e e

1. This assume *uniformitarianism* (i.e. natural laws operate uninterrupted).
2. But, the creation event was a ***miracle*** which violates uniformitarian assumptions.
3. God created the universe to be functional.
4. Things sometimes take time to mature to be functional.
5. Therefore, God instantaneously creating functional things may necessarily include undetectable "baked-in" time.
 - a. Example: Jesus turning water to wine without fermentation time.
 - b. Example: Stars created to serve a visible time markers on earth without light travel time.
 - c. Example: Eve & Adam created sexually mature to populate the earth without puberty time.
6. God is telling us *directly* in the Bible what happened whereas scientific data are *indirect*.





Christian Proto-Evolution

Christian Anticipations of Common Ancestry

"Let the waters it is said bring forth abundantly moving creature that has life and fowl that may fly above the earth in the open firmament of heaven". Why do the waters give birth also to birds? Because there is, so to say, a family link between the creatures that fly and those that swim. In the same way that fish cut the waters, using their fins to carry them forward and their tails to direct their movements round and round and straightforward, so we see birds float in the air by the help of their wings. Both endowed with the property of swimming, their common derivation from the waters has made them of one family. At the same time no bird is without feet, because finding all its food upon the earth it cannot do without their service."

- Basil, Hexaemeron Homily VIII, 370 A.D.



Christian Anticipations of Common Ancestry



It should scarcely be passed without remark that Calvin's doctrine of creation is...for all except the souls of men, an evolutionary one. The "indigested mass," including the "promise and potency" of all that was yet to be, was called into being by the simple fiat of God. But all that has come into being since – except the souls of men alone – has arisen as a modification of this original world-stuff by means of the interaction of its intrinsic forces...God is the prima causa omnium and that not merely in the sense that all things ultimately – in the world-stuff – owe their existence to God; but in the sense that all the modifications of the world-stuff have taken place under the directly upholding and governing hand of God, and find their account ultimately in His will. But they find their account proximately in "second causes"; and this is not only evolutionism but pure evolutionism.

"Calvin's Doctrine of Creation", B.B. Warfield. Princeton Theological Review, xiii. 1915, pp. 190-255

<https://reformed.org/christianity-and-science/calvins-doctrine-of-the-creation-by-b-b-warfield/>

Christian Anticipations of Common Ancestry



Calvin's ontology of second causes was, briefly stated, a very pure and complete doctrine of concursus, by virtue of which he ascribed all that comes to pass to God's purpose and directive government. But that does not concern us here. What concerns us here is that he ascribed the entire series of modifications by which the primal "indigested mass," called "heaven and earth," has passed into the form of the ordered world which we see, including the origination of all forms of life, vegetable and animal alike, inclusive doubtless of the bodily form of man, to second causes as their proximate account. And this, we say, is a very pure evolutionary scheme. He does not discuss, of course, the factors of the evolutionary process, nor does he attempt to trace the course of the evolutionary advance, nor even expound the nature of the secondary causes by which it was wrought. It is enough for him to say that God said, "Let the waters bring forth. . . . Let the earth bring forth," and they brought forth...Calvin doubtless had no theory whatever of evolution; but he teaches a doctrine of evolution.

Christian Anticipations of Common Ancestry



He has no object in so teaching except to preserve to the creative act, properly so called, its purity as an immediate production out of nothing. All that is not immediately produced out of nothing is therefore not created – but evolved. Accordingly his doctrine of evolution is entirely unfruitful. The whole process takes place in the limits of six natural days. That the doctrine should be of use as an explanation of the mode of production of the ordered world, **it was requisite that these six days should be lengthened out into six periods – six ages of the growth of the world. Had that been done Calvin would have been a precursor of the modern evolutionary theorists.** As it is, he only forms a point of departure for them to this extent – that he teaches, as they teach, the modification of the original world-stuff into the varied forms which constitute the ordered world, by the instrumentality of second causes – or as a modern would put it, of its intrinsic forces. This is his account of the origin of the entire lower creation.



Scientific Evidences
BIOLOGY

The “Kinds” of Genesis 1: What Is the Meaning of *Mîn*?

Fixity: The "kinds" created by God are the original species of which there has been no transition and no extinction.

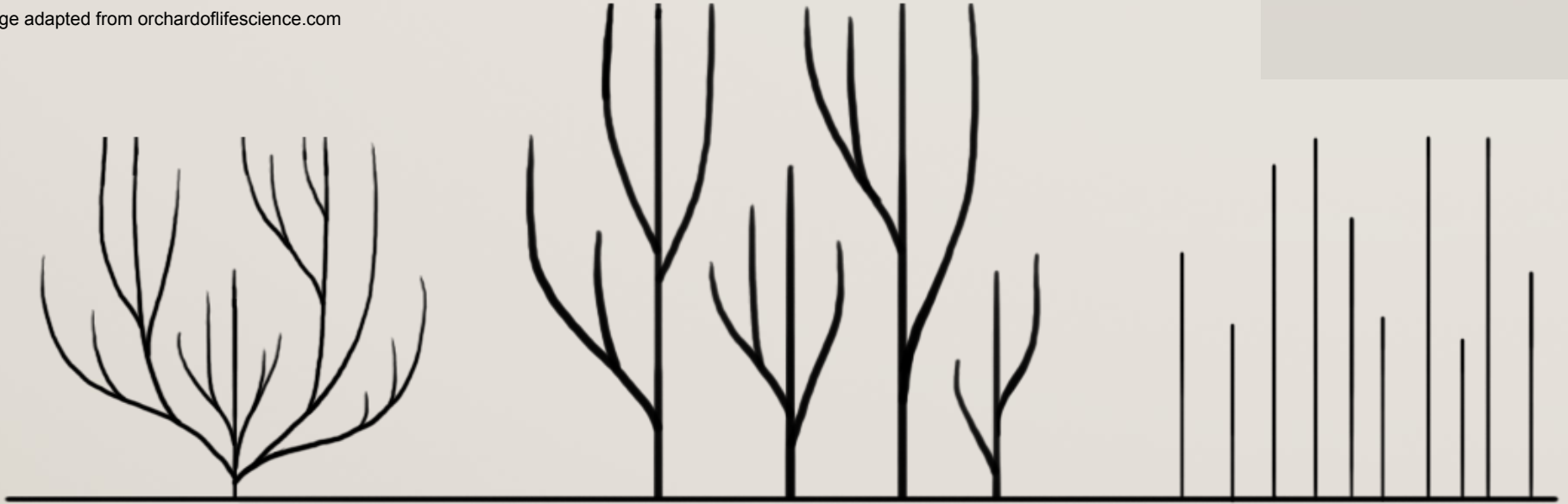
Variety: The "kinds" refer to the variety within the broader group, e.g. "all kinds of birds" or "all kinds of creeping things".

Taxonomic: The "kinds" refer to a rudimentary taxonomy meant to group the creatures **phenomenologically**. There is no serious biological implicature *vis a vis* boundaries of the kinds. Bats (mammals) and birds are grouped because they fly, whales (mammals) and fish are grouped because they swim.



Relationship of Creatures

Image adapted from orchardoflifescience.com



Universal Common Ancestry
"Tree of Life"

Local Common Ancestry
"Orchard of Life"

No Common Ancestry
"Lawn of Life"

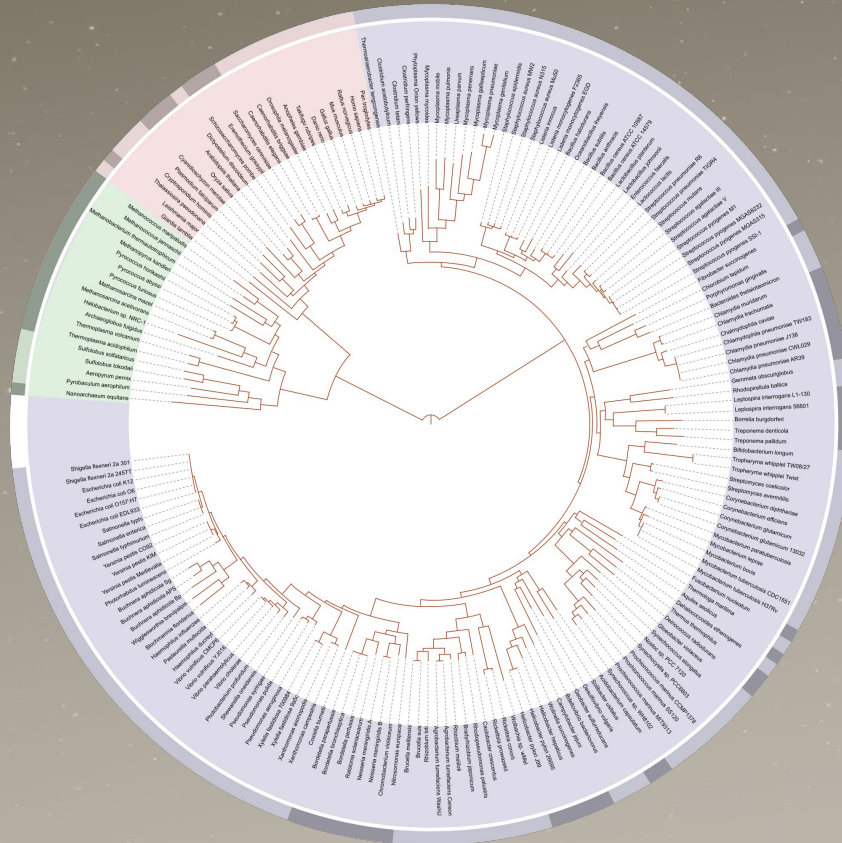
Compatible with "Fixity"

Compatible with "Variety"

Compatible with "Taxonomic"



Tree of Life



Common Ancestry of the Biosphere

Biblical Data

How do we interpret "after their kind"?

- **Fixity** of the species
- **Variety** of types
- Proto-**Taxonomy**

Scientific Data

What features of the biosphere point toward common ancestry?

- Common fossil morphology
- Protein functional redundancy
- **DNA functional redundancy***
- Transposons
- Redundant pseudogenes
- **Endogenous retroviruses***

Common Ancestry of the Biosphere

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Is all life related by common descent? - Genetic Code

Shared Genetic Machinery

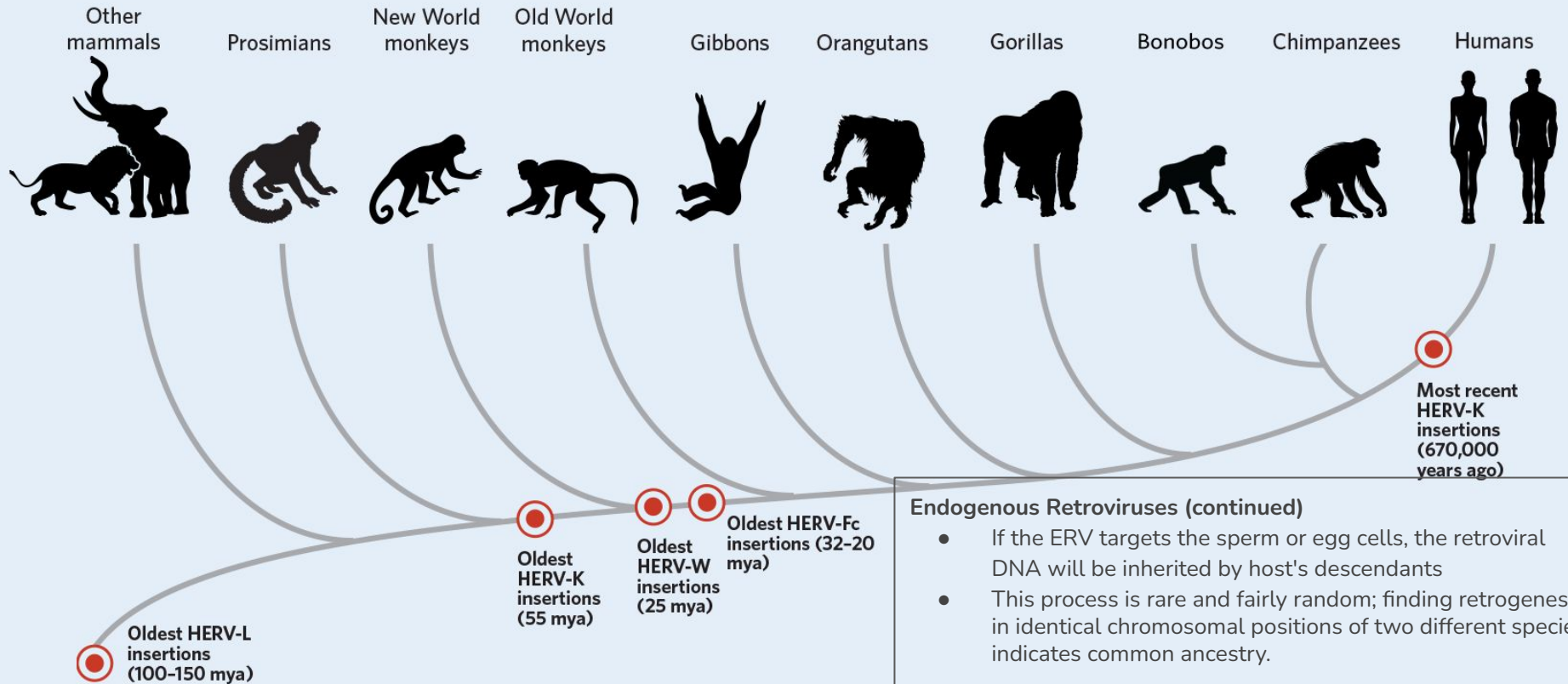
- Distant organisms (bacteria vs mammal) sharing genetic machinery means translation b/w base triplets & amino acids is probably universal to all life.
 - Recombinant DNA technology is built on the assumption of a universal code.
- Example: Isolated mRNA injected in E. coli produces rabbit hemoglobin.

Endogenous Retroviruses

- Endogenous retroviruses (ERVs) are molecular remnants of a past parasitic viral infection.
- Copies of a retrovirus genome are found in its host's genome, and these retroviral gene copies are called endogenous retroviral sequences. Retroviruses make a DNA copy of their own viral genome and insert it into their host's genome.

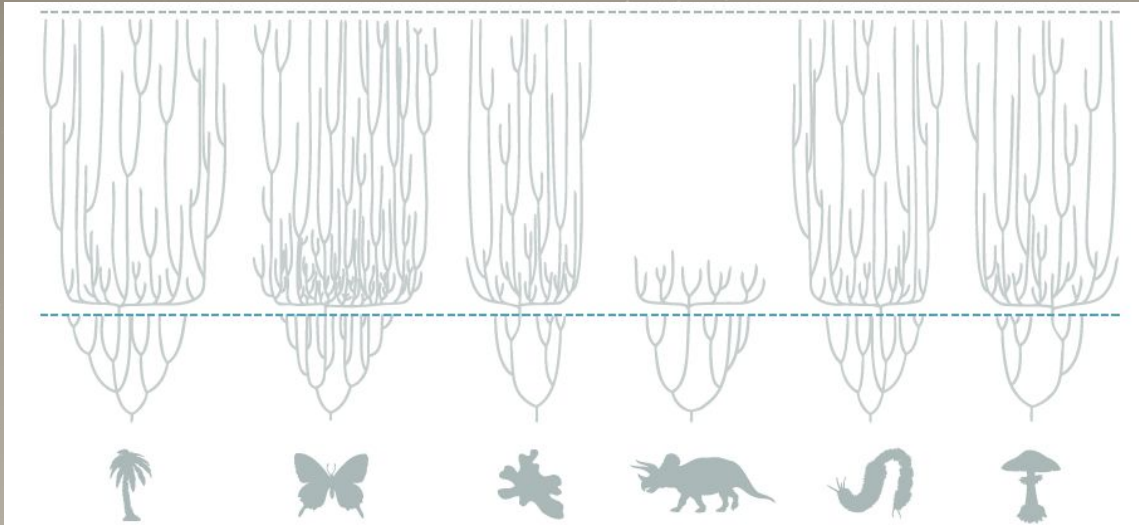


Is all life related by common descent? - ERVs



How to Integrate?

- The **Variety** and **Proto-Taxonomic** interpretations of *min* (kind) are broadly compatible with any view of descent.
- Adherents to **Fixity** interpretations primarily argue for common design as an alternative explanation to common descent.





Biology Theories

Common Design



"Much like Ford and Chevy have similar cars that are not related by common descent, the similar morphology and genetic code of animals can be attributed to common design"



Common Design: Evaluation

"Much like Ford and Chevy have cars that are not related by common descent, the shared morphology and genetic code of animals can be attributed to common design"

Evaluation

- Common design works in principle (like appearance of age).
- Decently explains similar genetic machinery
- Difficulties addressing non-functional parts of the genetic code
 - Why would a common design feature pseudogenes?
 - ERVs imply designer used animals *in situ*
- Cars are not created by natural generation, but biological creatures are; in all other areas of shared biological morphology, common ancestry is the normal inference.



How does the Bible say that God created?

Genesis 1-2

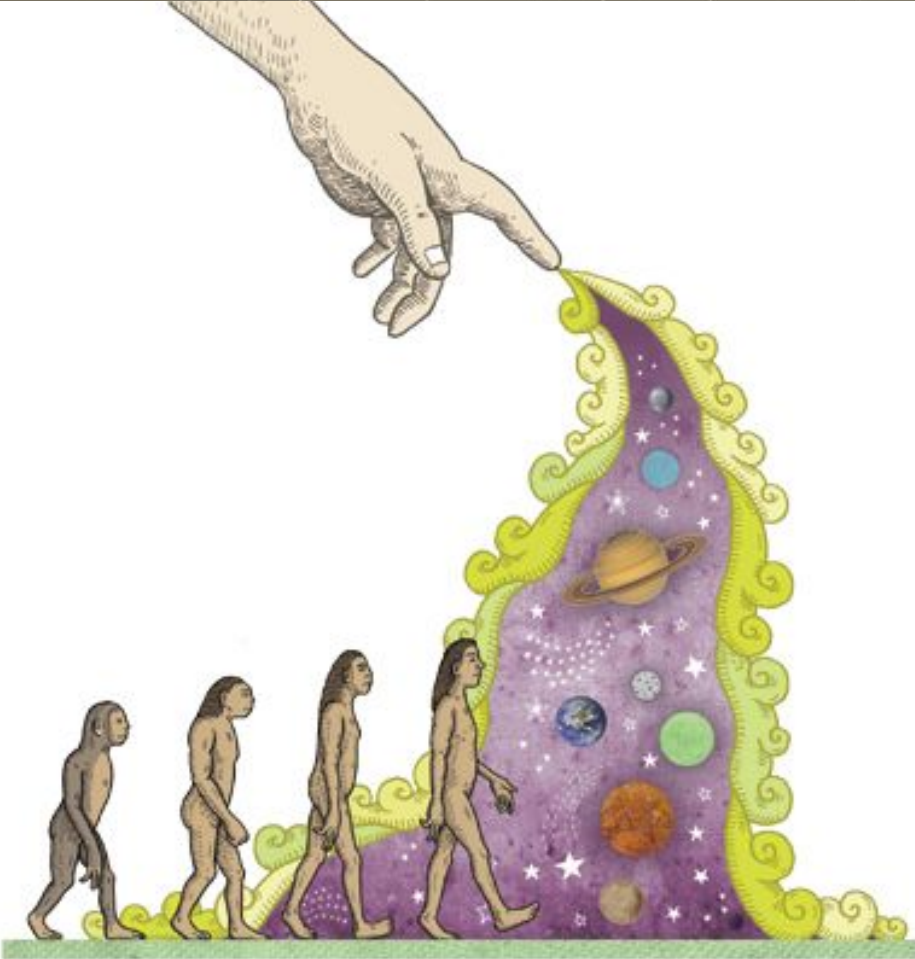
- Surprisingly vague. God commands things and they happen; in many instances, God invokes secondary causes, e.g. "let the earth bring forth..."
- Creation of humanity in Gen 2 is more explicit, but cannot be taken as a template for God's creative act of the other creatures.

Psalms 104 // Job 38-40

- Largely poetic accounts of creation, difficult to take too literally.
- Speak of God's actions in the world through sustaining the natural cycles of predation, rain



How does the Bible say that God created?



Summary of the Biblical data

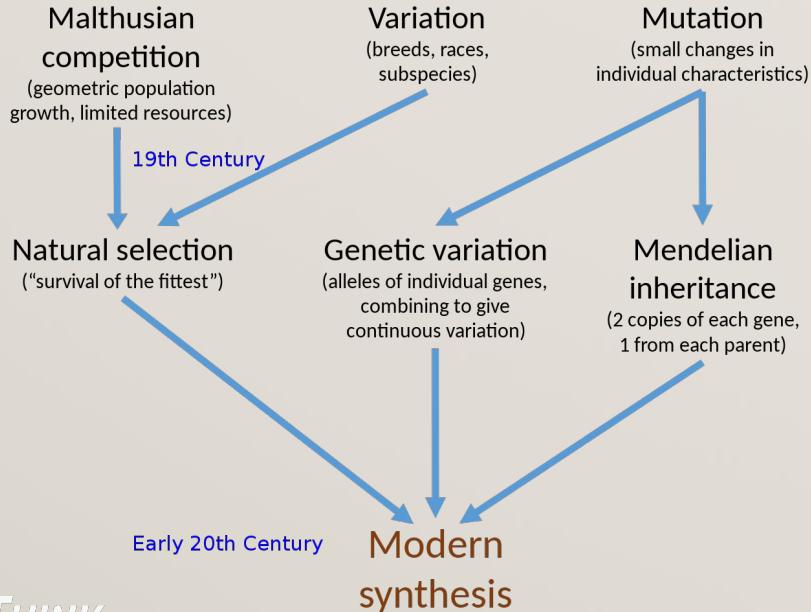
- Scripture does propose a specific causal method by which God created the earth and life within it.
- Secondary causes and natural cycles are used in God's creating and sustaining of the universe.
- Creation did not involve purposelessness.

**THINK
THEISM**

The Modern Synthesis Revives Darwinism

1. Mendelian genetics provided the mechanism of inheritance.
2. Population genetics provided the mathematical framework for allele frequency.
3. The Modern Synthesis was still committed to Darwin's view of gradualism.

Random Variation
+ Natural Selection
+ Time
= Evolution!

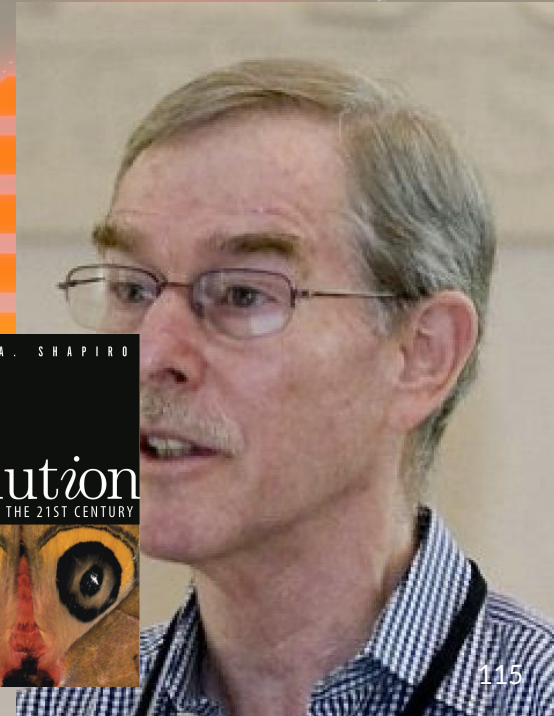
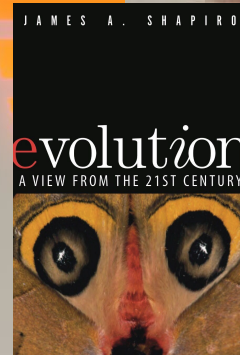


Extending Evolution

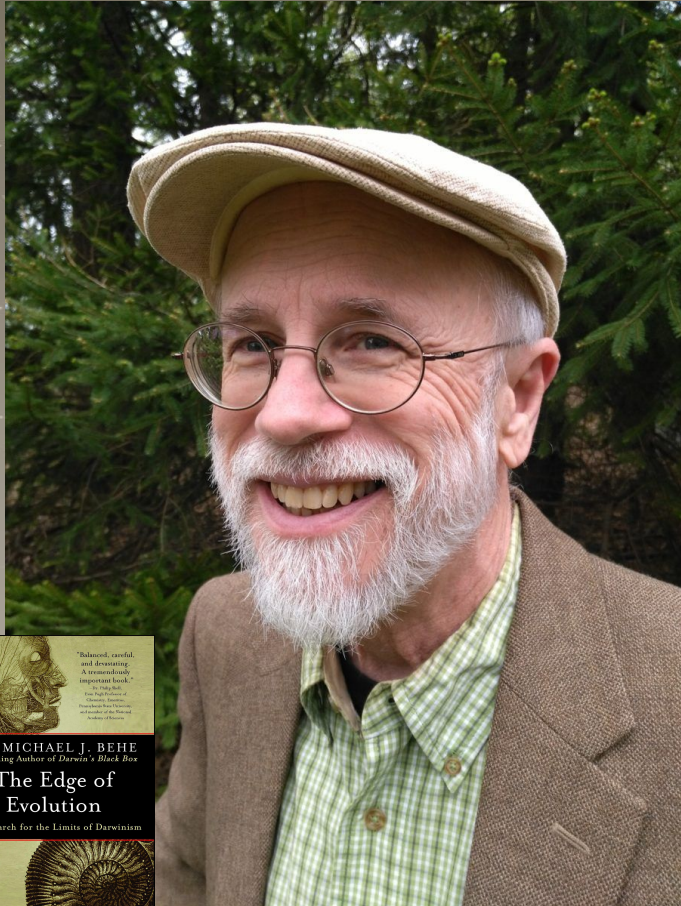
“The one issue that has effectively been settled in a convincing way is the evidence for a process of evolutionary change over the past three billion years. However, little evidence fits unequivocally with the theory that evolution occurs through the gradual accumulation of 'numerous, successive, slight modifications' (Darwin, 1859).”

- Dr. James A. Shapiro

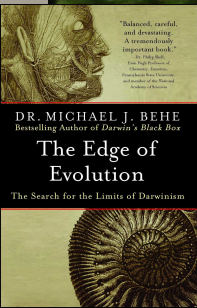
Evolution: a view from the 21st century (2011) pg. 128



What is the Edge of Darwinism?



"Evolution from a common ancestor, via changes in DNA is very well supported. It may or may not be random. Thanks to evolution, scientists who sequence human DNA and find mutations that are helpful - against, say, our natural enemies - are not just studying the DNA of one person...When scientists sequence a genome, they are unfurling rich evidence of evolution - Darwinian or otherwise - unavailable by any other method."

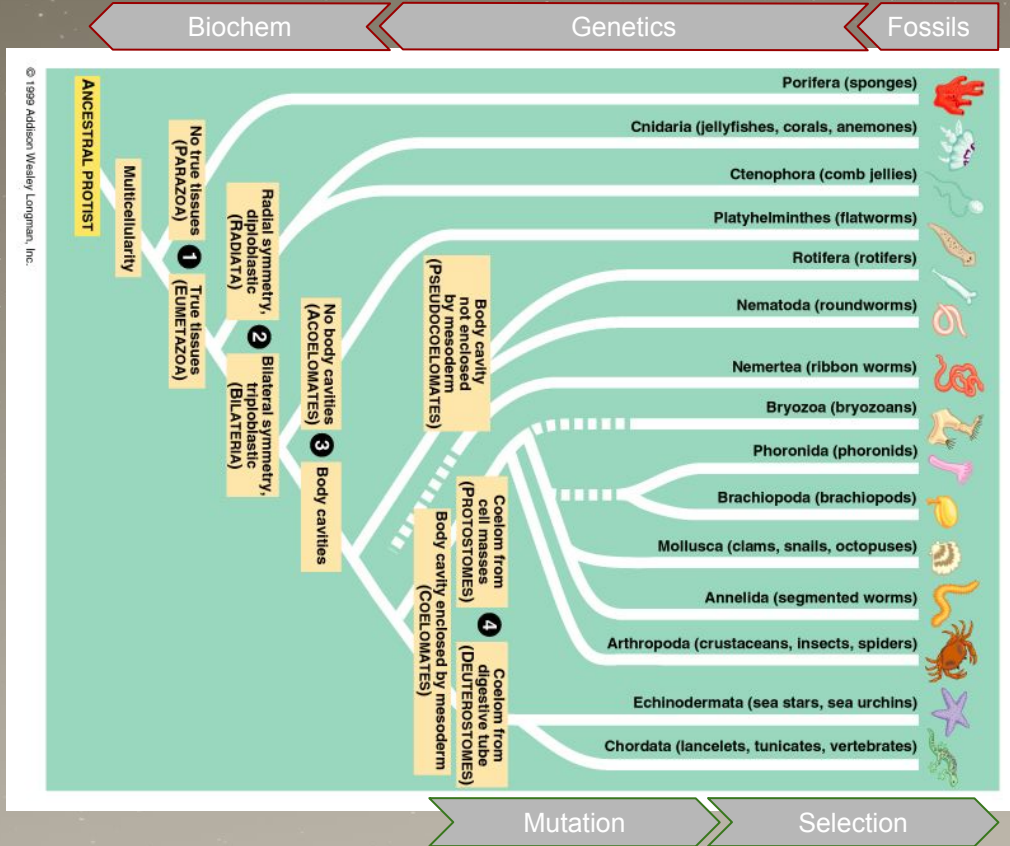


- Dr. Michael J. Behe
The Edge of Evolution (2007), pg.12

**THINK
THEISM**

The eclipse of Neo-Darwinism

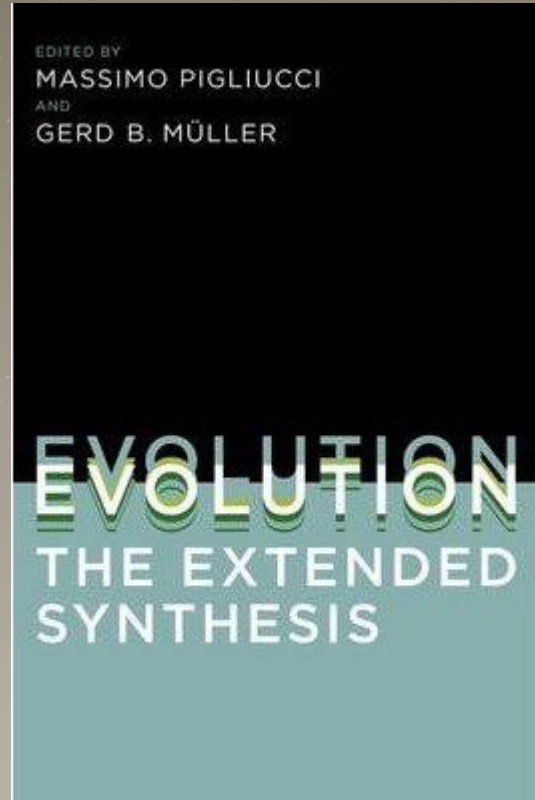
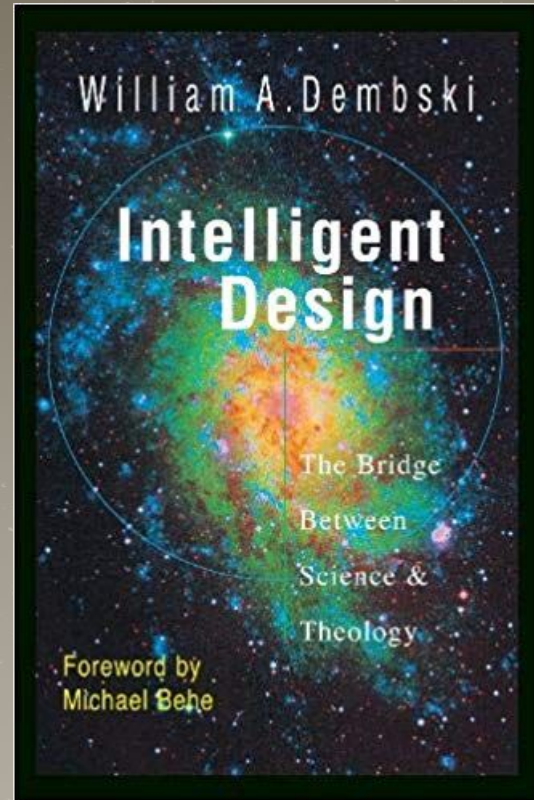
Retrospective Forensic Evidence



Prospective Mechanisms



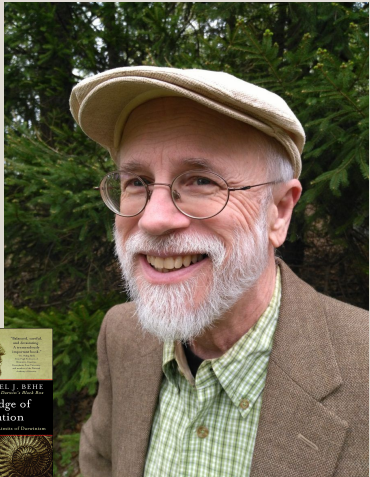
How to bridge the gap?



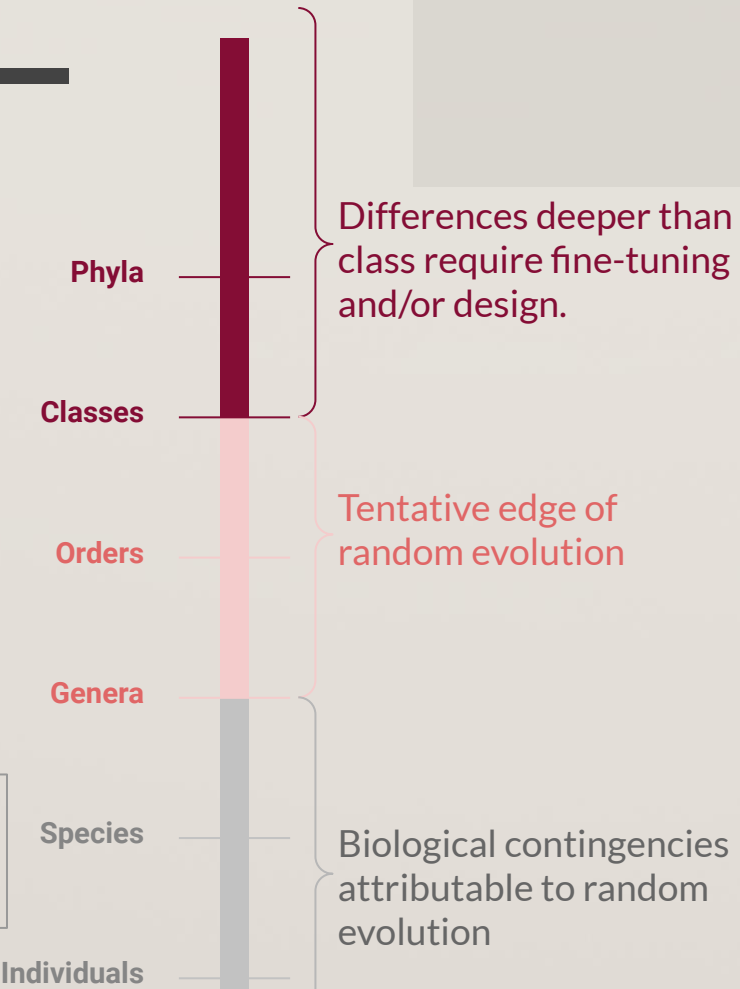
Bridging the Gap with Intelligence

"From what has been learned in the past few decades about the complexity of the genetic basis of animal development, it seems reasonable to think that purposeful design extends into biology at least to the level of the major classes of vertebrates, perhaps further."

- Michael J. Behe
The Edge of Evolution (2007), pg. 217-218



"Michael Behe Interview"
<http://rc-tamu.org/podcast/darwinism-devolving-an-interview-w-dr-michael-behe/>



Differences deeper than class require fine-tuning and/or design.

Tentative edge of random evolution

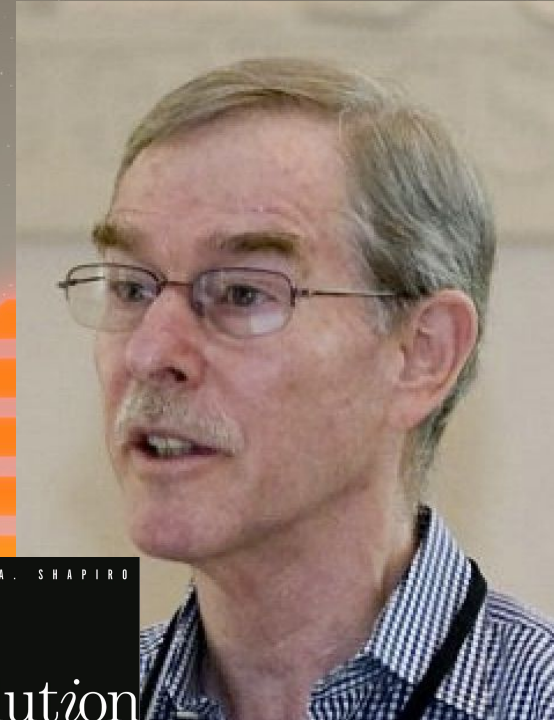
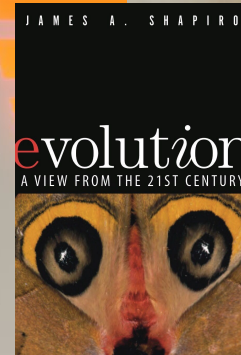
Biological contingencies attributable to random evolution

Bridging the Gap by Extending Evolution

“The one issue that has effectively been settled in a convincing way is the evidence for a process of evolutionary change over the past three billion years. The reason the answer to this question is so solid is that every new technological development in biological investigation - from the earliest days of paleontology through light microscopy and cytogenetics up to our current molecular sequence methodologies - has told the same story: living organisms, past and present, are related to each other, share evolutionary inventions, and have changed dramatically over the history of the Earth. **However, little evidence fits unequivocally with the theory that evolution occurs through the gradual accumulation of "numerous, successive, slight modifications" (Darwin, 1859). On the contrary, clear evidence exists for abrupt events of specific kinds at all levels of genome organization.** These sudden changes range from horizontal transfers and the movement of transposable elements through chromosome rearrangements to whole genome duplications and cell fusions. **[We must] search for alternative conceptual foundations that better account for our current knowledge of genome change over evolutionary time.**”

- Dr. James A. Shapiro

Evolution: a view from the 21st century (2011) pg. 128



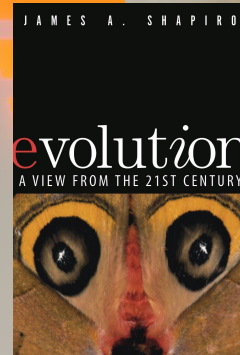
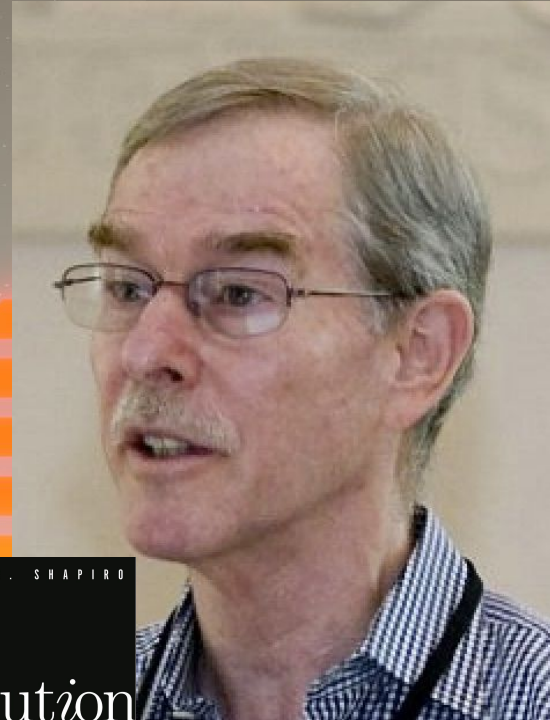
**THINK
THEISM**

Bridging the Gap by Extending Evolution

“The perceived need to reject supernatural intervention unfortunately led the pioneers of evolutionary theory to erect an a priori philosophical distinction between the “blind” processes of hereditary variation and all other adaptive functions.”

- Dr. James A. Shapiro

Evolution: a view from the 21st century (2011) pg. 2



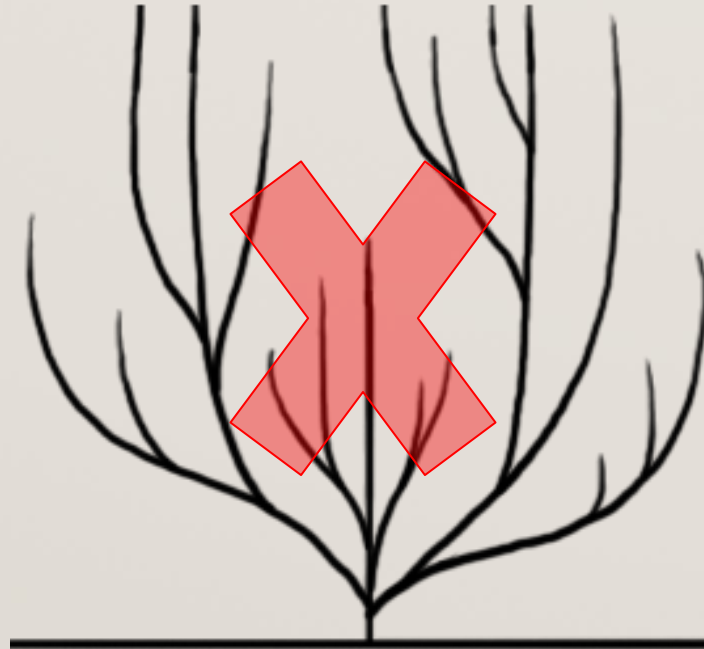
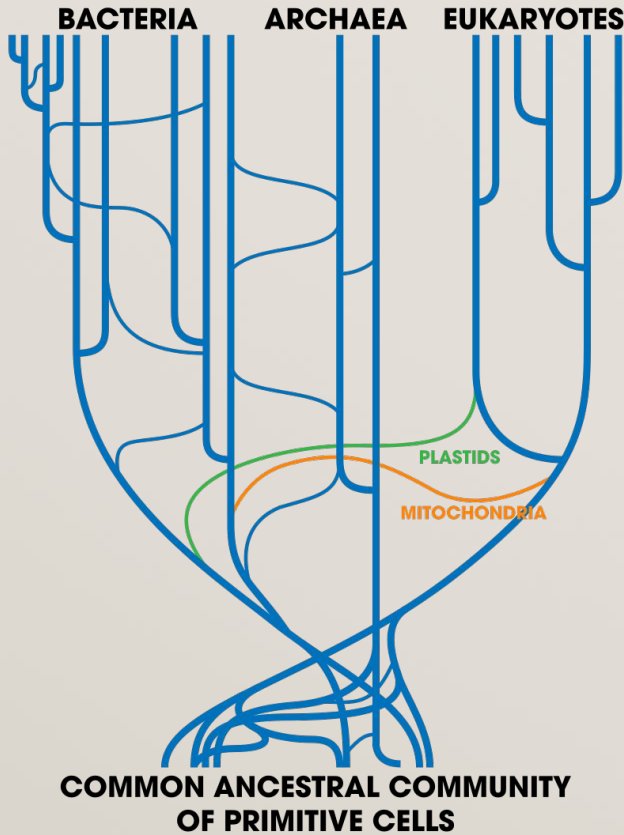
**THINK
THEISM**

The 5 Blades of the Evolutionary "Swiss Army Knife"

1. **Transposition** – DNA repairs damage by replacing broken parts with replicable sections in other chromosomes. The repairs lead to changes in the DNA, mutations, that can change or improve the DNA creating offspring with these changes.
2. **Horizontal Gene Transfer** – seen mostly in single celled organisms, genes can be passed between cells allowing the receiving cell to achieve the benefits of the supplying cell.
3. **Epigenetics** – The process of genes switching on and off portions of code to change what kind of cell grows.
4. **Symbiogenesis** – One type of cell merging with another to create a symbiotic relationship and, eventually, an organelle.
5. **Genome Duplication** – Two species reproduce offspring with hybrid genomes from each parent.



How Evolution Actually Works



Evidence for Common Ancestry

Claim: Evolutionary theory predicts that the genomes we observe in living primates (such as humans and chimpanzees) are, in fact, modified forms of an original genome present in the common ancestor of these species.

Lines of Evidence

- **Similarity** of Gene Sequencing, i.e. genetic homology
 - amino acid level (the functional sequence of a given gene's protein product),
 - nucleotide code level (the underlying DNA code for the required amino acid sequence).
- **Synteny** - conservation of gene order along chromosomes between relatives, i.e. homologous genes appear in a very similar spatial pattern
- **Pseudogenes** - mutated remains of gene sequences that persist in the genome after inactivation.
- **Endogenous Retroviruses** - molecular remnants of a past parasitic viral infection.



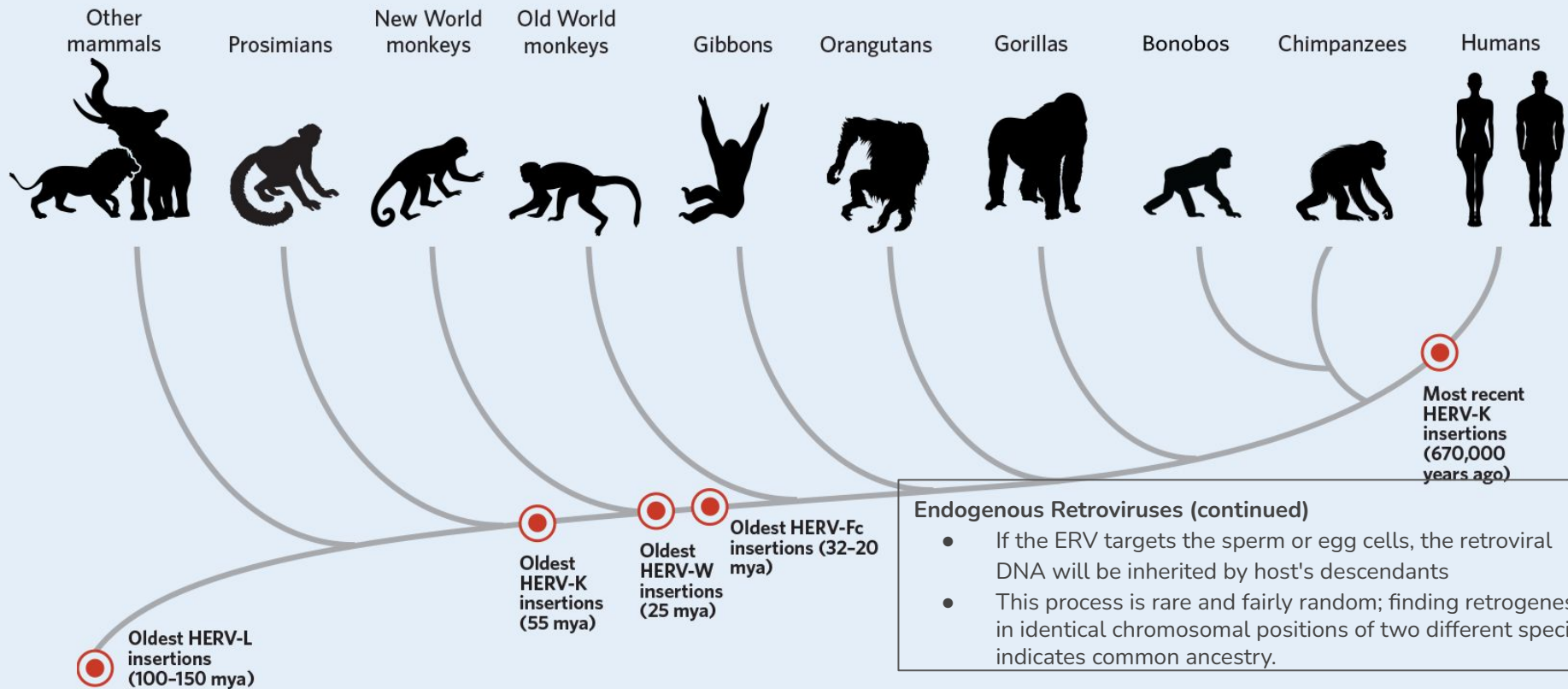
Figure 1. Nucleotide and Amino Acid Homology for Insulin in Mammals

A

HS	atg	gcc	ctg	tgg	atg	cgc	ctc	ctg	ccc	ctg	ctg	gcg	ctg	ctg	gcc	ctc	tgg	gga	cct	gac	
PT	atg	gcc	ctg	tgg	atg	cgc	ctc	ctg	ccc	ctg	ctg	gtg	ctg	ctg	gcc	ctc	tgg	gga	cct	gac	60
GG	atg	gcc	ctg	tgg	atg	cgc	ctc	ctg	ccc	ctg	ctg	gcg	ctg	ctg	gcc	ctc	tgg	gga	cct	gac	
PP	atg	gcc	ctg	tgg	atg	cgc	ctc	ctg	ccc	ctg	ctg	gcg	ctg	ctg	gcc	ctc	tgg	gga	cct	gac	
RF	atg	gcc	ctg	tgg	atg	cgc	ctc	ctg	ccc	ctg	ctg	gcc	ctg	ctg	gcc	ctc	tgg	aca	cct	gcc	
MM	atg	gcc	ctg	tgg	atg	cgc	ttc	ctg	ccc	ctg	ctg	gcc	ctg	ctc	ttc	ctc	tgg	gag	tcc	cac	
	Met	Ala	Leu	Trp	Met	Arg	-	Leu	Pro	Leu	Leu	-	Leu	Leu	-	Leu	Trp	-	-	-	20
	1	4	6	1	1	6		6	4	6	6		6	6		6	1				

Figure 1A. The complete nucleotide coding sequence for pre-proinsulin aligned for four primate species (HS = *Homo sapiens* /human, PT = *Pan troglodytes*/chimpanzee, GG = *Gorilla gorilla*/gorilla, PP = *Pongo pygmaeus*/Bornean orangutan), one chiropteran (RF = *Rhinolophus ferrumequinum*/greater horseshoe bat) and one murid (MM = *Mus musculus*/mouse). Nucleotides that differ from the human sequence are shaded in black. Amino acids conserved in all six species are given below the nucleotide sequence. Numbers below codons conserved in all six species indicate the number of codon alternatives for that position.

Endogenous Retroviruses



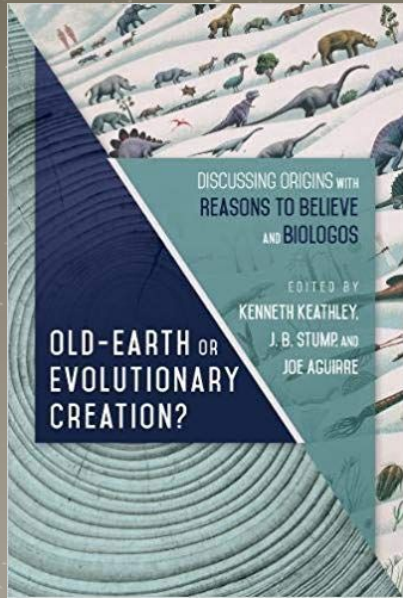
Endogenous Retroviruses (continued)

- If the ERV targets the sperm or egg cells, the retroviral DNA will be inherited by host's descendants
- This process is rare and fairly random; finding retrogenes in identical chromosomal positions of two different species indicates common ancestry.

A 3D wireframe landscape rendered in a vibrant cyan color. The terrain is composed of numerous interconnected triangles, creating a jagged, mountainous appearance. In the foreground on the left, a more complex, multi-faceted object is highlighted in a bright cyan glow. To the right, a large sphere is partially visible, featuring horizontal stripes in a gradient from yellow to orange. The background is a dark, starry space with a subtle purple and blue gradient. The overall aesthetic is futuristic and digital.

Models of Adam and Eve

Different Models of Adam & Eve



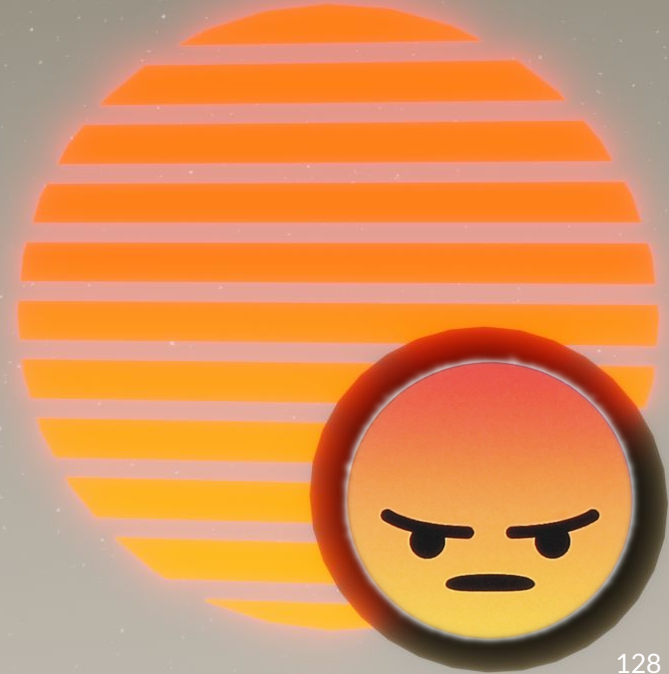
Ch. 3 of *Old Earth or Evolutionary Creation?*
(2017, IVP Academic)

Individual Biological* Ancestors:

- A&E were recently (< 10,000 ya) or anciently (100,000+ ya) created biological ancestors of the entire human race

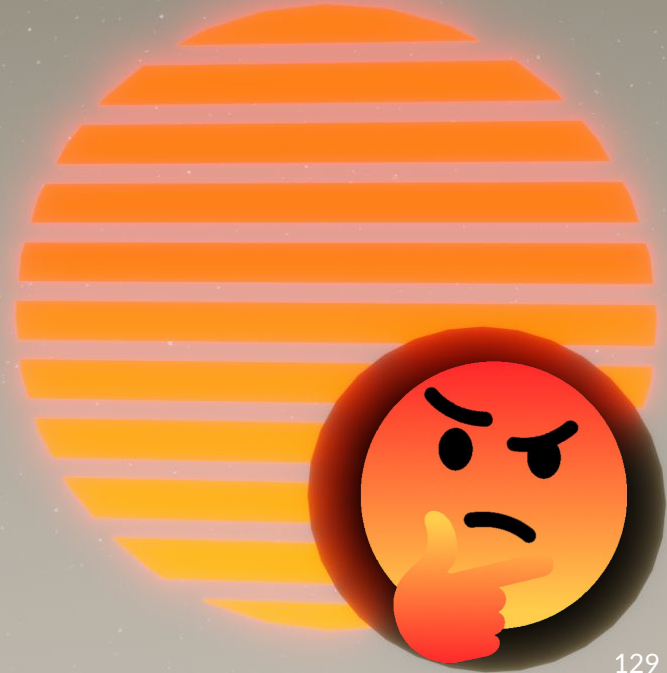
Individual Representative-Ancestors:

- A&E were a divinely selected/created pair in a **group** of human ancestors to federally represent the human race

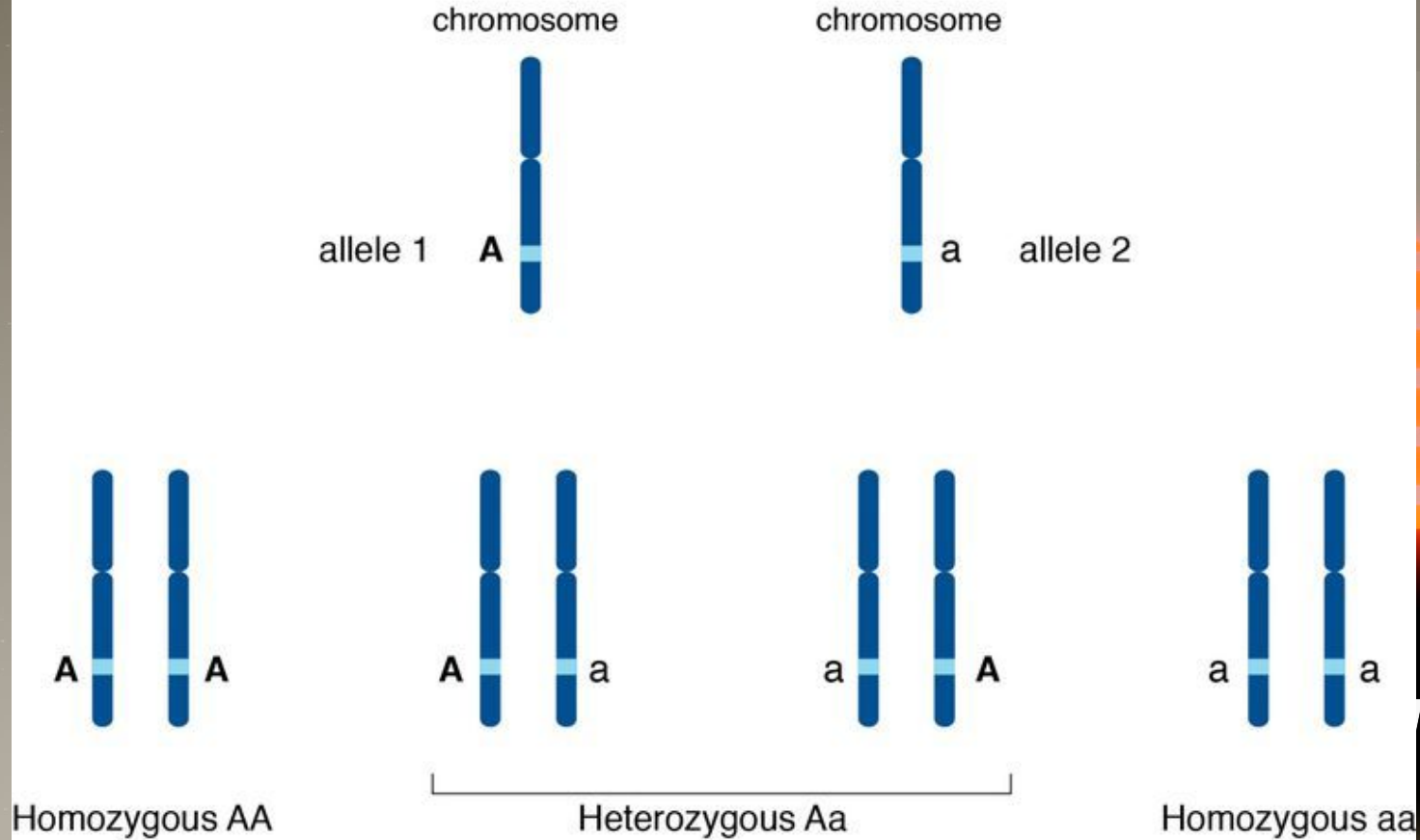


Tangent: Did Adam Have Contemporaries?

- Are the creation accounts describing same events?
 - "Fill the earth and subdue it" (Gen 1) vs "work and tend the Garden" (Gen 2)
- Conundra of Cain (Gen 4:8-17)
 - Whom did he fear?
 - Whom did he marry?
 - Who lived in his city?
- Possible solution: God creates a group of humans *en masse* in Gen 1. Then, creates A&E in Gen 2 for a special revelation
- Possible solution: God creates A&E as the first people, then more people emerge after their banishment



Biology Review



**THINK
HEISM**

Evidence for Ancestral Population Sizes

Multiplicity of alleles: There are just too many different alleles in the present population to have all come from an original human couple within the last 18 million years

Divergence of alleles: mutational distances between alleles in a population are too far to have originated with a single pair in the recent past.

Effective population size estimates: Various independent methods of estimating past population size all concur that the human population in the past was never fewer than around 10,000 people.

Trans-species variation: In order for all the alleles which we have in common with chimpanzees to be passed on to us from a common ancestor, there needed to be more than one couple who transmitted these genetic lines from that ancestor to us.



Evidence for Ancestral Population Sizes

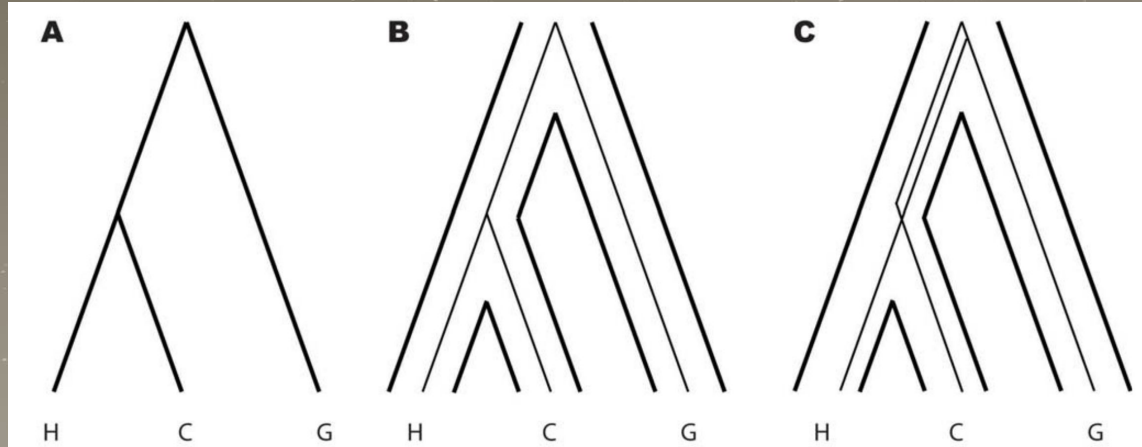


Figure 2. Species and Gene Trees for Human, Chimpanzee, and Gorilla

A. Comparative primate genomics strongly supports a primate species tree that groups humans (H) and chimpanzees (C) as more recently diverged relative to gorilla (G). Most genes in humans and chimpanzees coalesce before coalescence with gorilla (**B**); however, a minority coalesce first with gorilla (**C**). This alternative gene tree arises when variants of these genes were maintained in the human-chimpanzee common ancestral population after gorillas branch off (**C**). Accordingly, the proportion of genes in humans with a gene tree discordant with the species tree can be used to infer the effective population size of the lineage leading to humans from the present to the point of divergence with gorilla. See text for details.



Two Key Questions Regarding Biological Ancestry

- What does "biological" ancestor entail?
 - Thus far, we have only considered genetic progenitorship but that is NOT the only definition nor the most relevant.
- When could Adam & Eve have lived?
 - Assuming genetic progenitorship, two-person bottleneck is possible no earlier than ~500,000 years ago

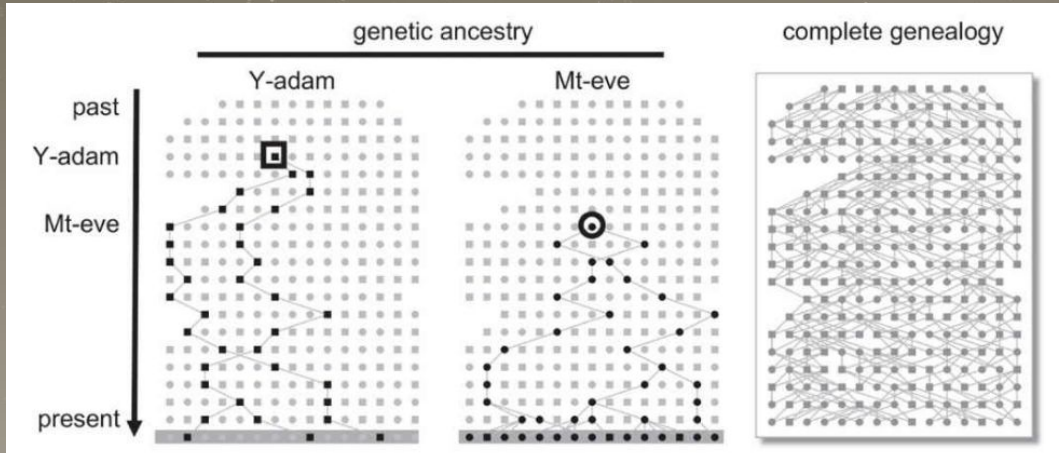


Two Key Questions Regarding Biological Ancestry

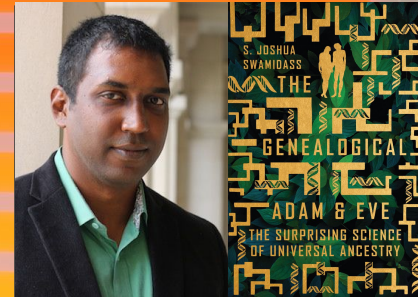
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The Genealogical Model - Swamidass



Genetic ancestry traces the history of small stretches of DNA. **Genetics is not an ordinary definition of ancestry, an anachronism in theology and Scripture.** Genetic ancestry spreads in a dissipating wave that slows down with time and disappears, just like a drop of dye. The majority of our genetic ancestors are “genetic ghosts” having no detectable genetic trace in our DNA. Consider that you have 50% of your father’s genetics, 25% of your grandfather, 12.5%...etc.

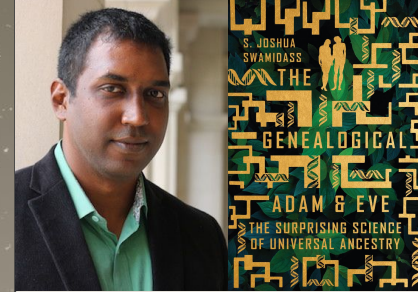


Joshua Swamidass, MD, PhD

"The Genealogical Adam & Eve" 135

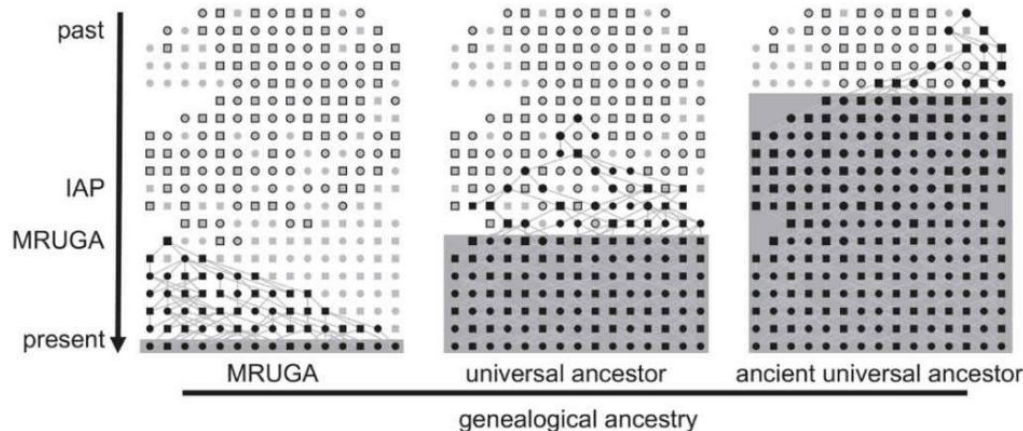
The Genealogical Model - Swamidass

Genealogical ancestry concerns the connections in family trees, pedigrees, and genealogies. It is an "ordinary" definition of ancestry. Consider that Genesis 5ff. (cf. Lk. 3, 1Ch 1) is a **genealogy** not a genome sequence. In contrast to genetics, genealogical descent is a binary: either someone is in your family tree or they are not. Your father is in your genealogical line as is your grandfather, great-grandfather, etc. and there is no dilution. In contrast to genetic ancestry, genealogical ancestry spreads like an explosion, in a chain reaction that does not dilute, but only grows. The number of people brought into a genealogical lineage grows at an increasing rate as time goes on. Consider you have 1 father, 2 grandfathers, 4 ggrandfathers, 8 gggfathers, etc. As you go back in time, ancestry increases exponentially while actual population decreases exponentially.

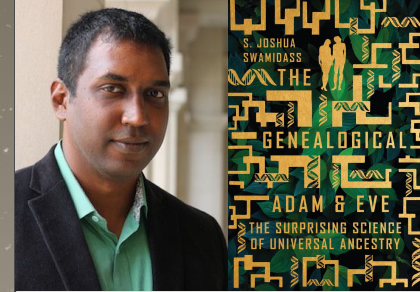


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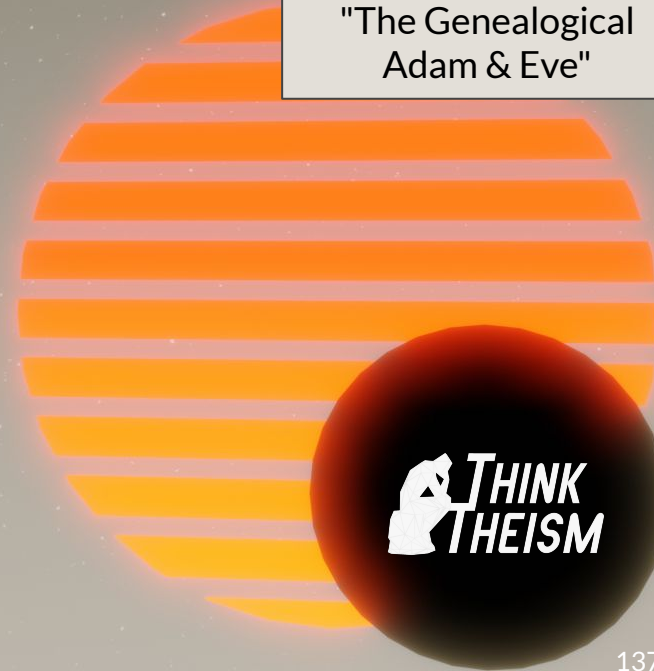
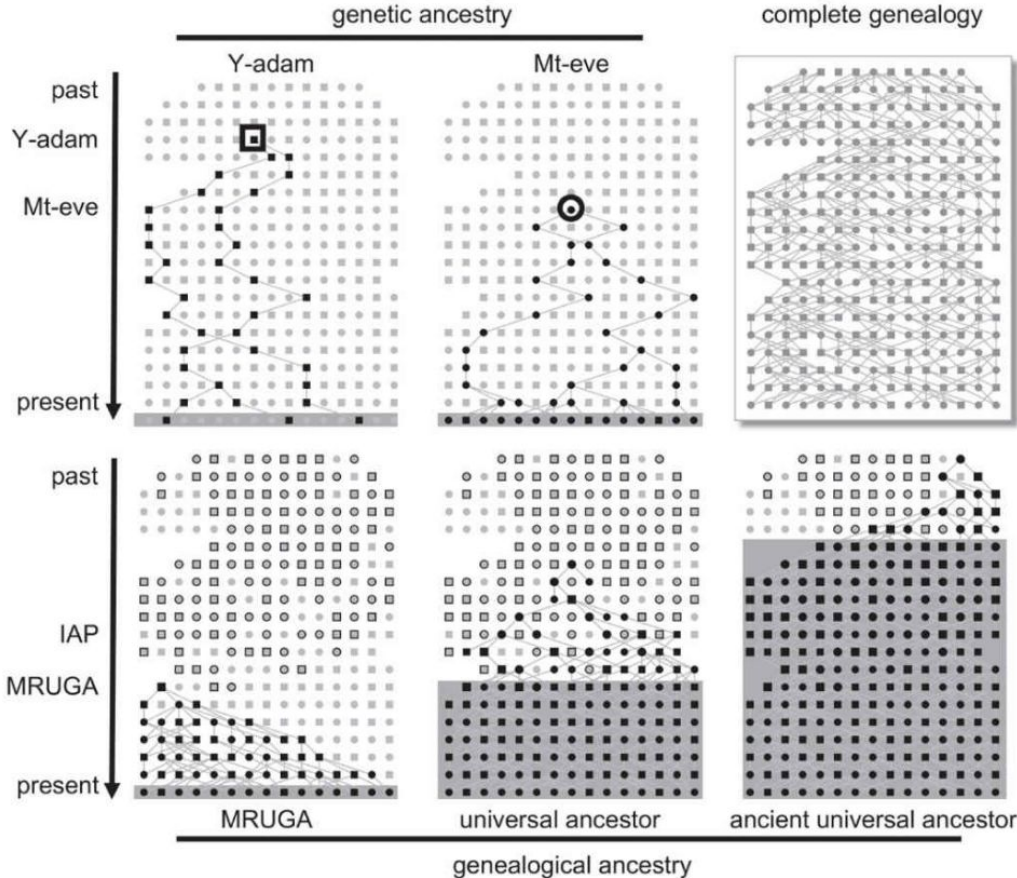


The Genealogical Model - Swamidass



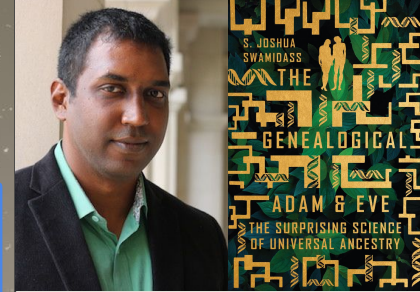
Joshua Swamidass, MD, PhD

"The Genealogical Adam & Eve"



**THINK
THEISM**

The Genealogical Model - Swamidass

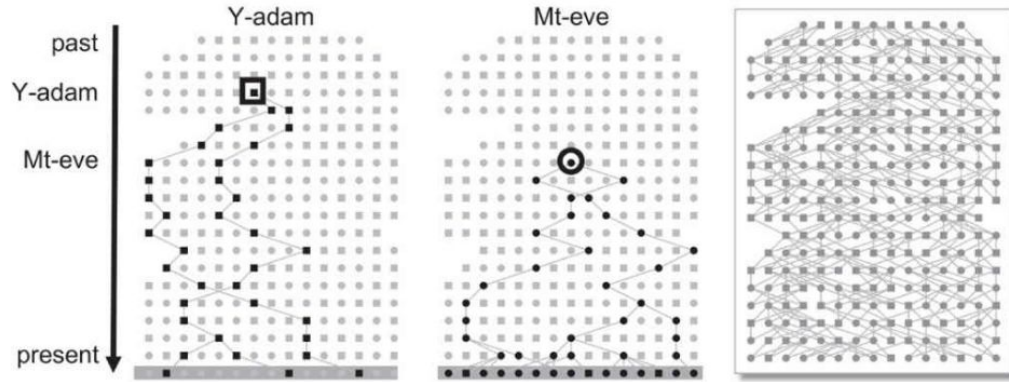


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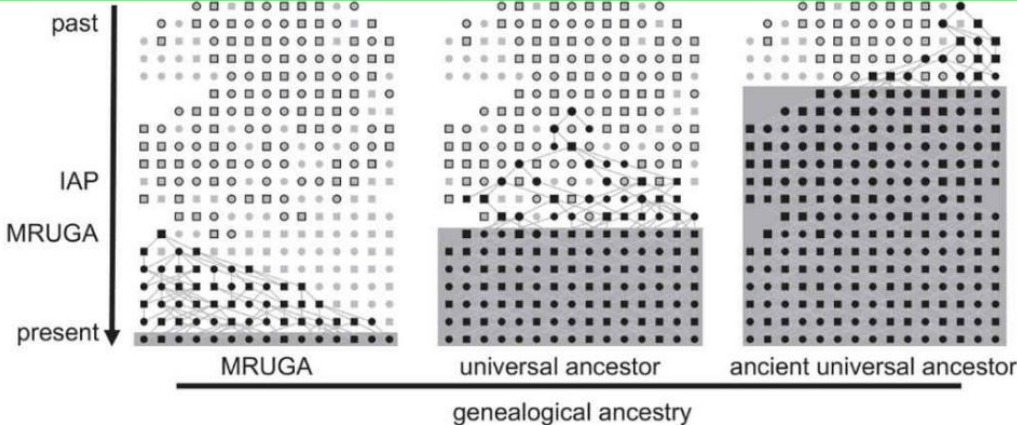
"The Genealogical Adam & Eve"

genetic ancestry

complete genealogy



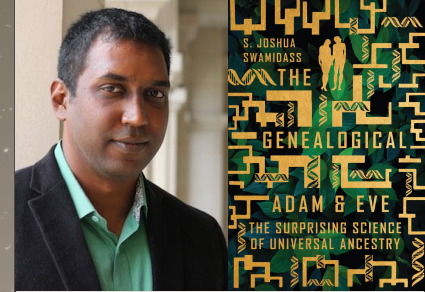
Genetic ancestry dilutes



Genealogical ancestry compounds

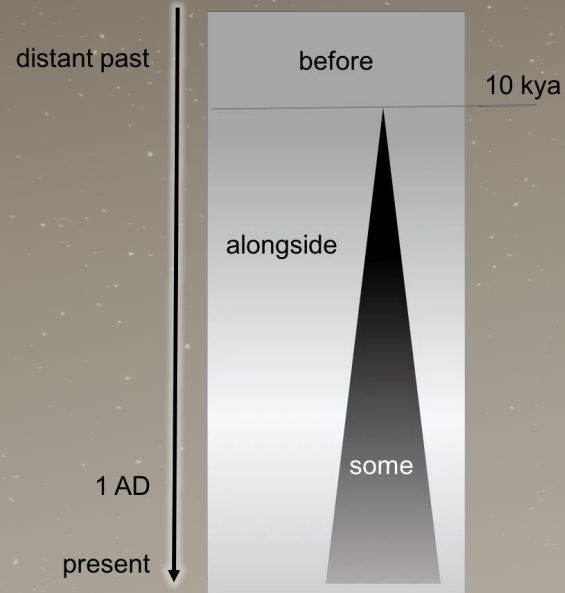


The Genealogical Model - Swamidass

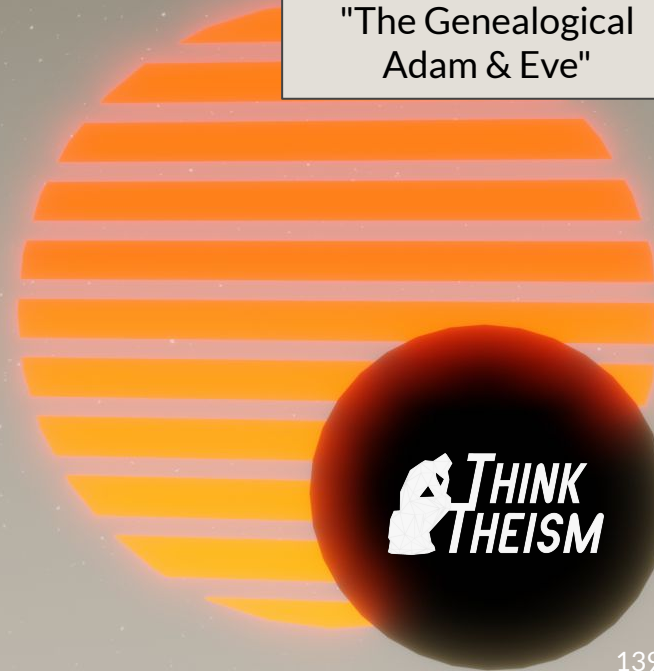


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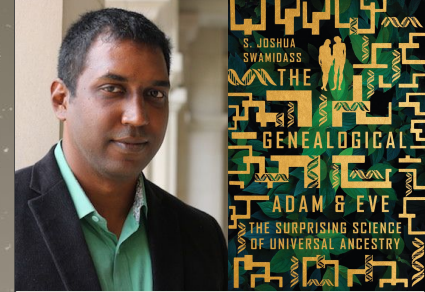
"The Genealogical Adam & Eve"



Genetic Ancestry
no recent universal ancestors
transmission not reliable

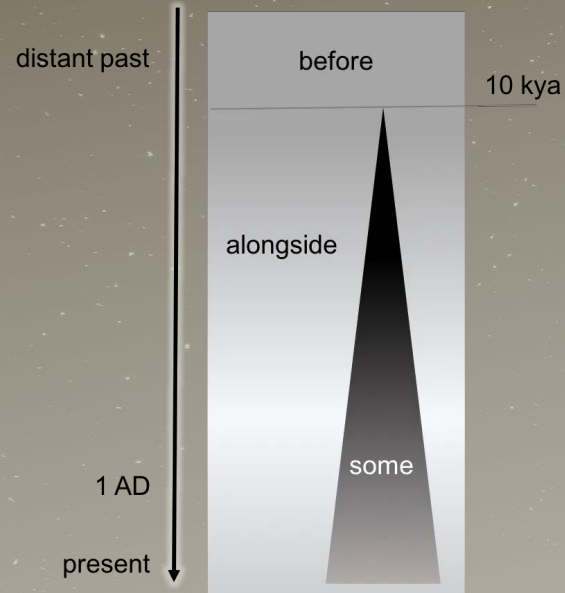


The Genealogical Model - Swamidass



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"The Genealogical Adam & Eve"



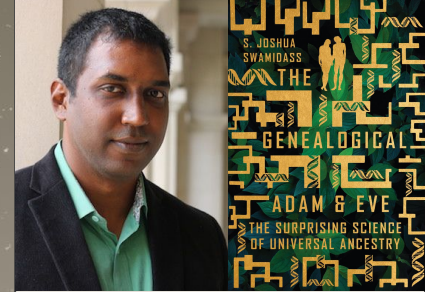
Genetic Ancestry
no recent universal ancestors
transmission not reliable



"Traditional" Account
silent "those outside garden"
and the era before Adam



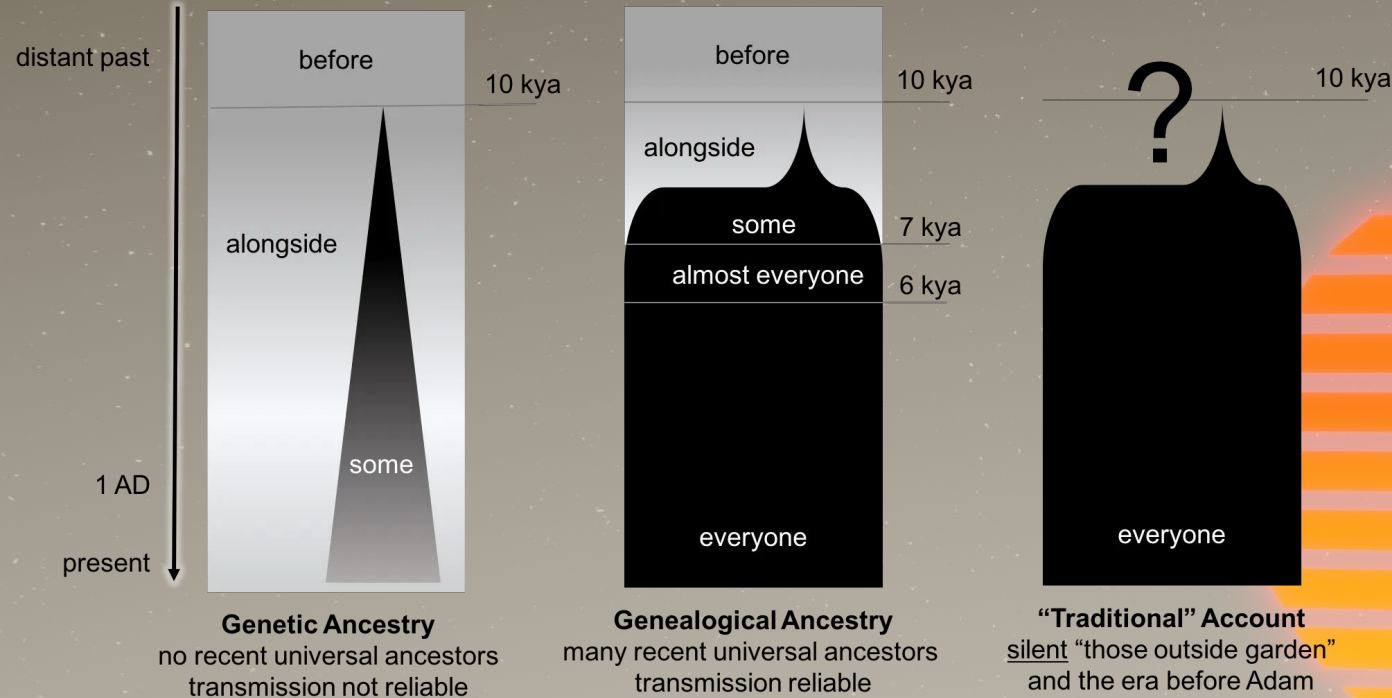
The Genealogical Model - Swamidass



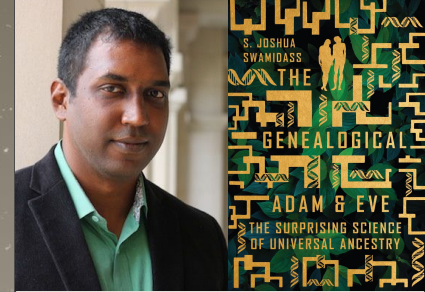
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"The Genealogical Adam & Eve"

Both / And

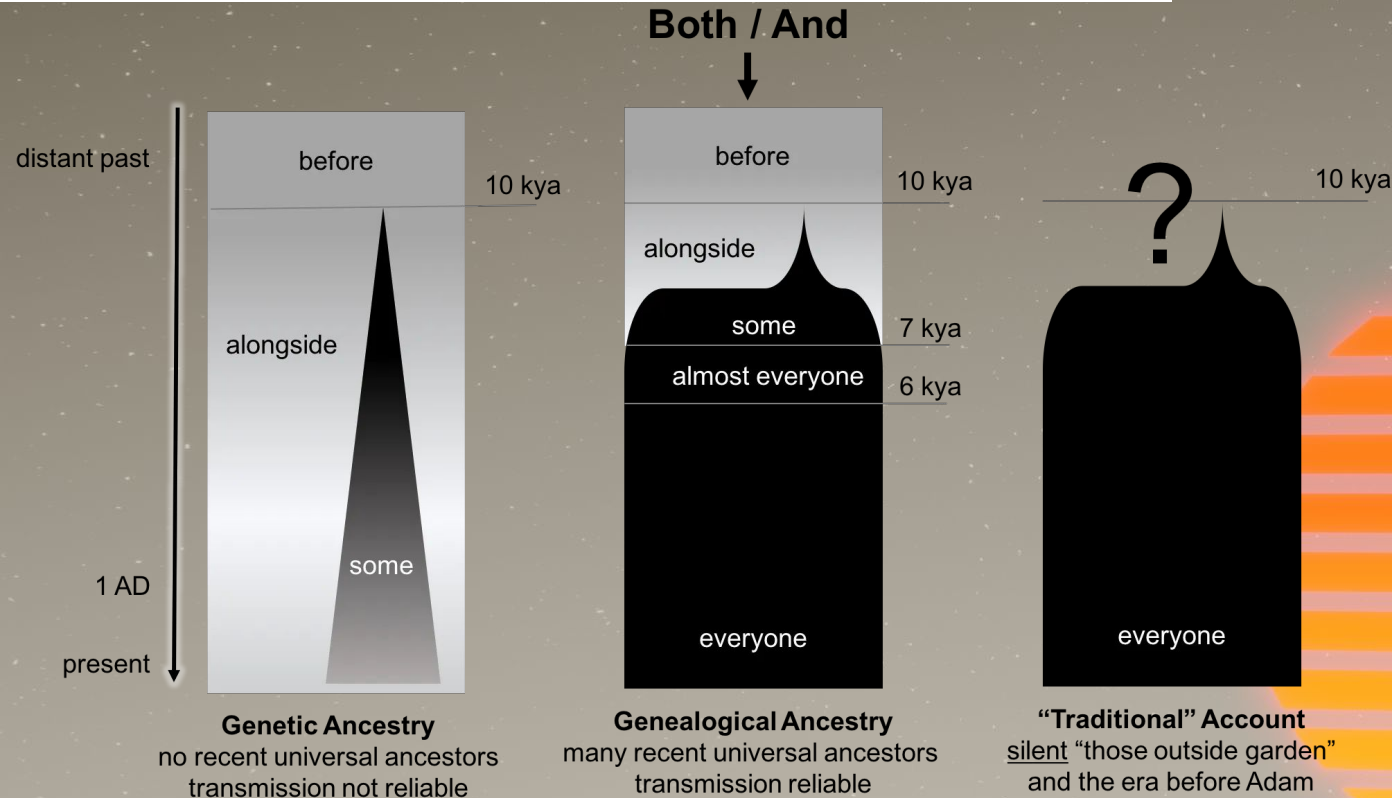


The Genealogical Model - Swamidass



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"The Genealogical Adam & Eve"



Compatible with
Mainstream Scientific Account

Compatible with
"Traditional" Account



Two Key Questions

- What is a "biological" ancestor?
 - Genetic ancestry
 - Genealogical ancestry
- When could Adam & Eve have lived?
 - Genetic bottleneck (possibly) 500,000+ years ago
 - Genealogical convergence 10,000 years ago



What does it all mean?

Are Adam and Eve in conflict with population genetics?

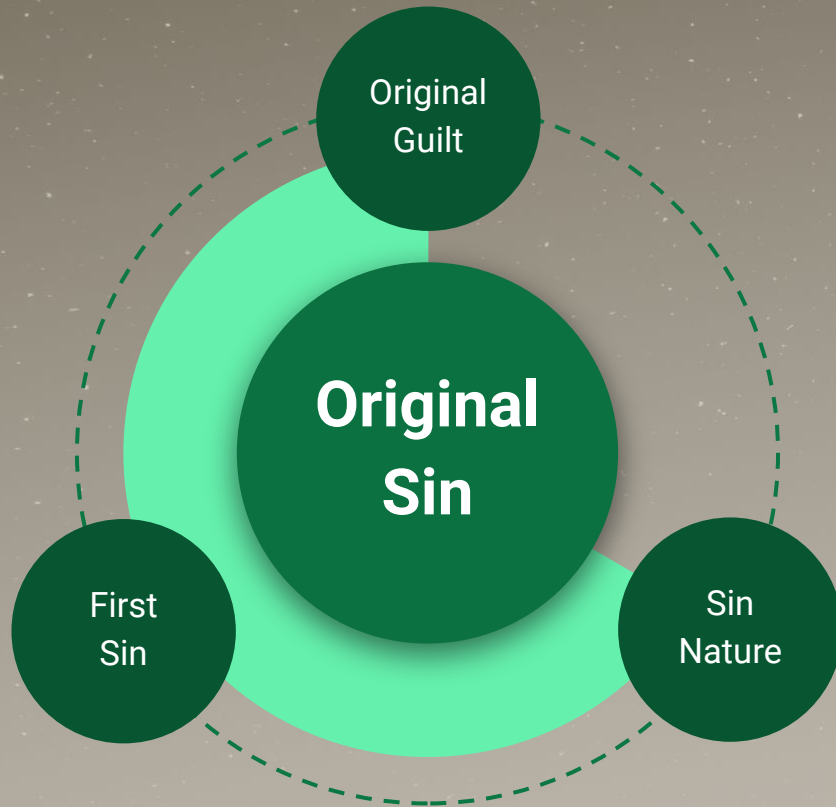
- Probably not, only one interpretation of Genesis would be in conflict, and only if you assume both that:
 - The Bible is discussing genetic ancestry, not genealogical ancestry
 - The Genetic ancestor is more recent than 500k years

What views of Adam and Eve are theologically permissible?

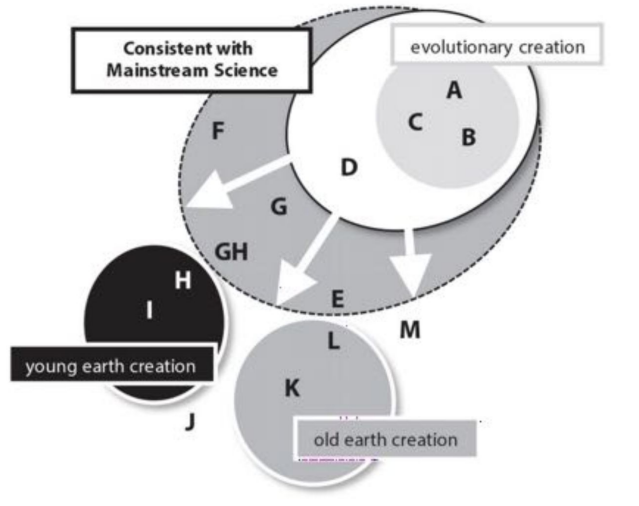
- There are multiple views that take Adam and Eve as historical persons
- Ultimately, secondary* theological considerations may lend weight to different views.
 - *secondary as in secondary inferences, not secondary importance



Original Sin and Literary Adam



Views on Adam



Creationist Camps	Elements of Adam and Eve Account				Status in Mainstream Science
	<i>de novo</i>	recent	universal ancestors	others outside garden	
evolutionary creation	A			X	consistent with evidence
	B		X	X	
	C			X	
	D			X	
young earth creation	E	X		X	tested by hypothesis
	F	X	X	X	
	G		X	X	
	GH	X	X	X	
	H	X	X	X	
old earth creation	I	X		X	ruled out by evidence
	J		X	X	
	K	X		X	
	L	X		X	
	M			X	uncertain

GH = The Genealogical Hypothesis

	Special Creation	Biological Progenitors	Other Humans	Cain's Wife?
YEC	Y	Y	N	Incest
GEN.	Y	N	Y	Kosher
TE	N	N	Y	Kosher