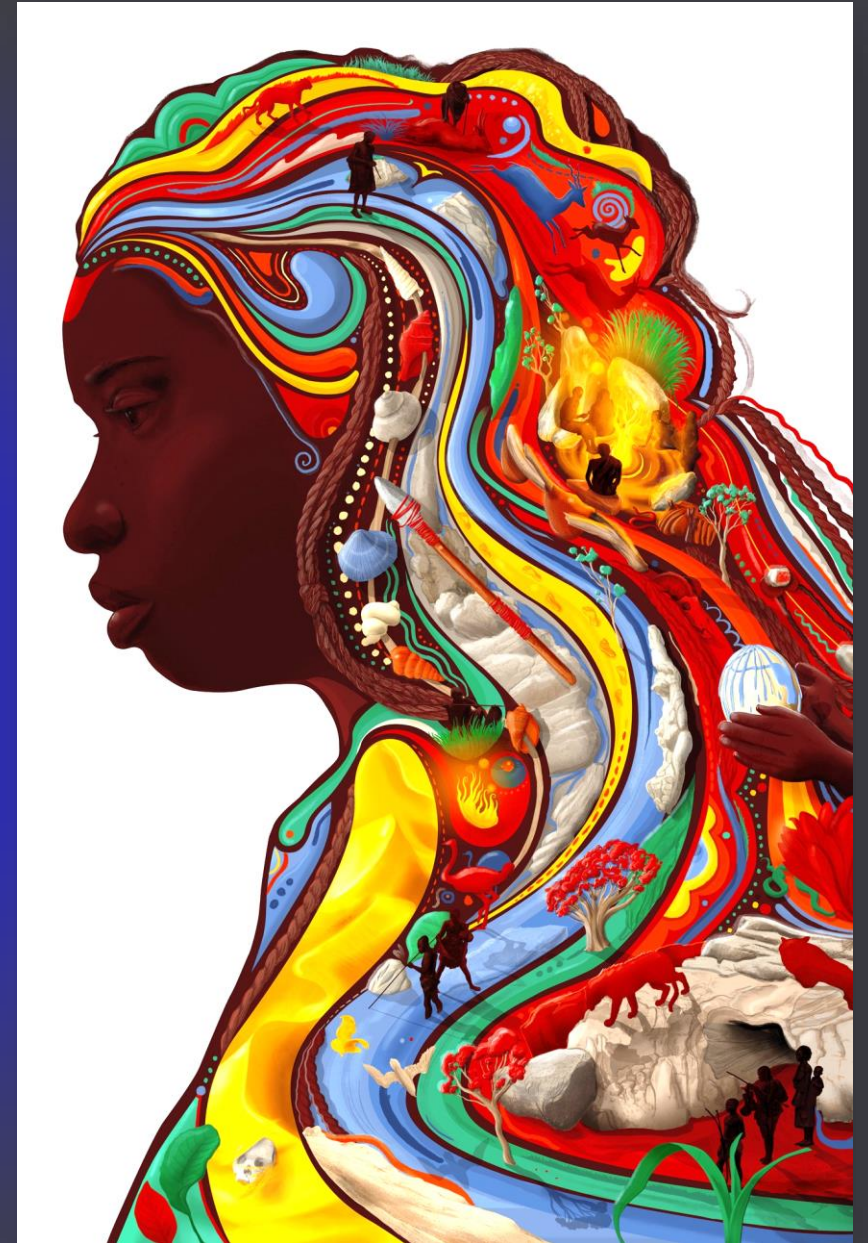


The Puzzle of the Human Origin

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Mitochondrial Eve | Concept Art by Sam Falconer

The Puzzle of the Human Origin

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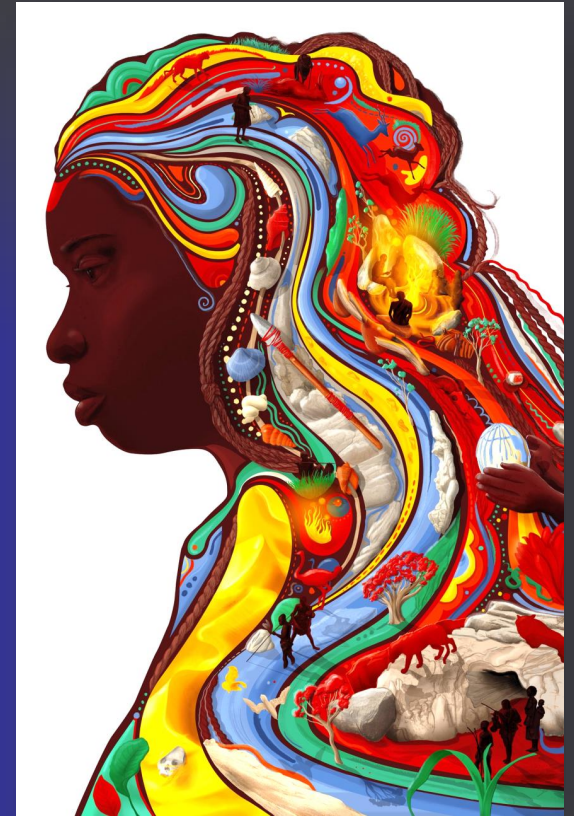
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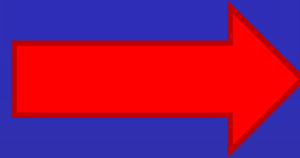
Abstract

It is a challenging endeavor to present a coherent vision of the beginning of humanity. It involves not only history and pre-history but also genetics, evolution, and on the other hand, anthropology. Also, the Judeo-Christian tradition, as expressed in Genesis, provides valuable suggestions for arranging the pieces of the puzzle. The main conclusion is that causes or interventions beyond biology play a crucial role in the origin of human persons.



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Introduction: what contributes to a solution of the puzzle?



stained glass window in the Cathedral of Brussels

What contributes to a solution of the puzzle?

Is a human being just a highly evolved animal?

What do we know about the evolution of hominins?

Why is there a genetic bottleneck for all present-day humans?

How was the cultural revolution possible about 70.000 years ago?

How can one explain the striking genetic continuity between humans and hominins?

If there is more, can one find -or otherwise define- a starting point?

Why is the first book in the Judeo-Christian tradition relevant for the puzzle?

A human being is more than an animal

the human person is convinced of an immortal soul,
is convinced of -and demands- personal freedom,
performs art and gives meaning to mathematical concepts,
agrees about human rights,

there is no general agreement in theory, in practise there is agreement.



two examples from art

Rembrandt:
Titus (his son)
as St. Francis

Vermeer van Delft:
Girl with pearl



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Svante Paäbo: Nobel Prize 2022

Nobel Prize 2022 in Physiology or Medicine; he established an entirely new scientific discipline, **paleogenomics**

he studied the DNA not only of now-living animals and humans, but also of extinguished hominins like Neanderthals

conclusion: Neanderthals are different from humans, and also of human antecessors but they are sufficient similar to allow interbreeding with fertile offspring.



Svante Paäbo: Nobel Prize lecture

skeleton of Neanderthal, left
and of modern human, right

The Neandertals “define” modern humans
How are we related to Neandertals?



Svante Paäbo: slide from noble Prize 2022 lecture

2022 Nobel Prize lecture in physiology or medicine



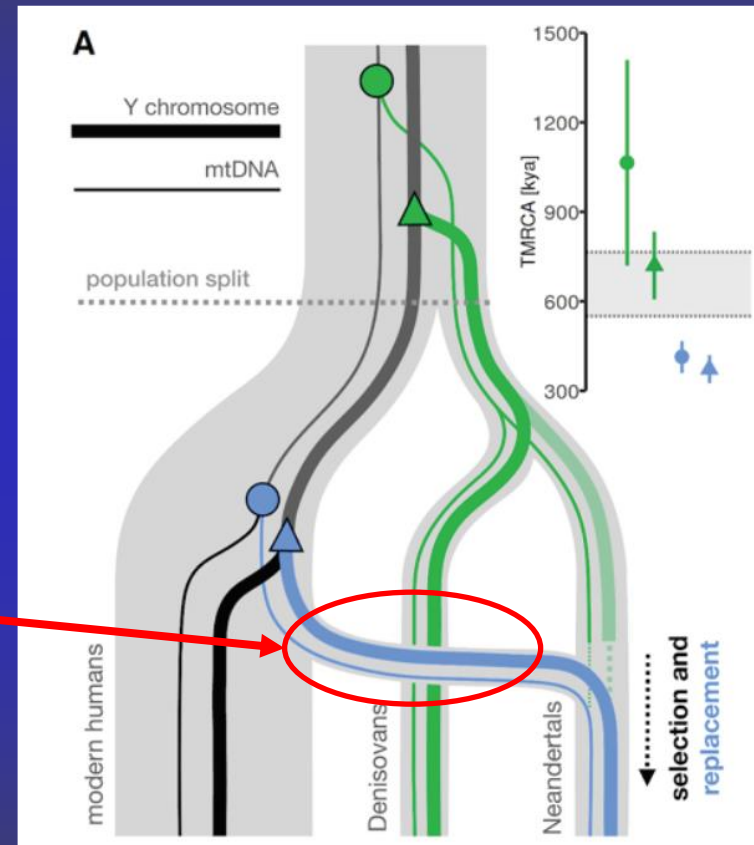
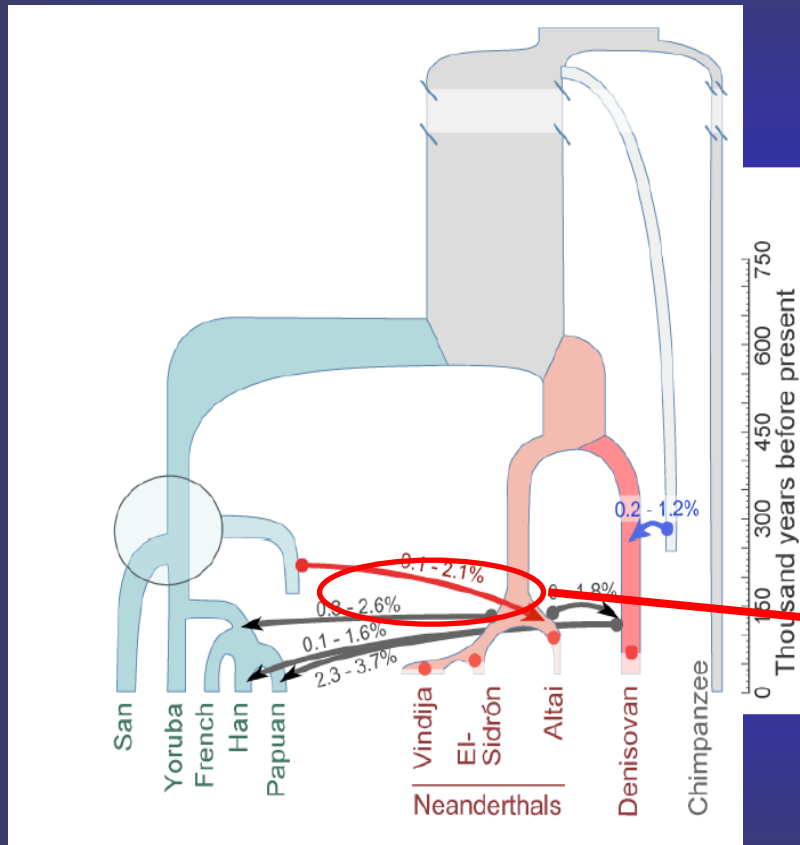
spreading of homo sapiens starting in Afrika



Slide after Prof. C. Wang, GU-CAS, Beijing

genetic evolution of hominins

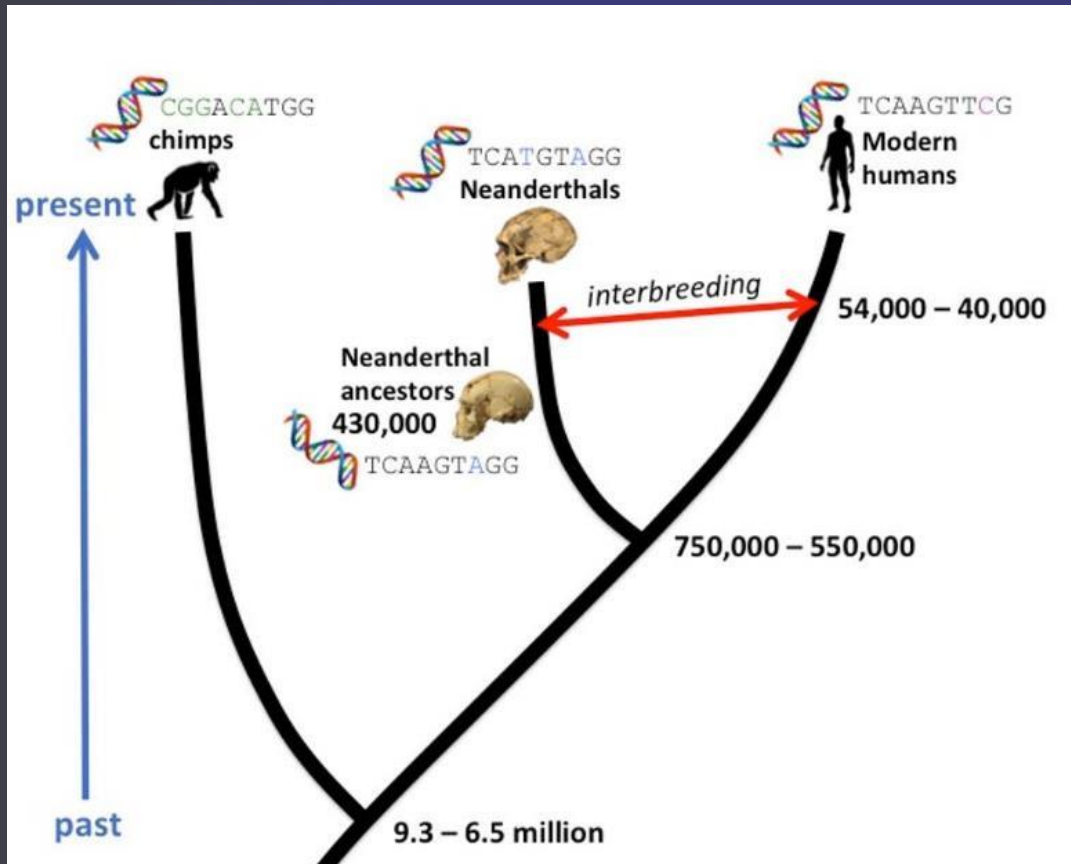
Kuhlwilm et al. *Ancient gene flow from early modern humans into Eastern Neanderthals*, Nature 2016, 530, 429-433



Petr et al. *The evolutionary history of Neanderthal and Denisovan Y chromosomes*, Science, 2020, 369, pp 1653-1656.

comparison: Kuhlwilm et al. (2016) and Petr et al. (2020) .
gene-flow from archaic humans to Neanderthal, and complete replacement (370 – 100 ka ago)

Genetic continuity between humans and hominins



difference in DNA

between homo sapiens and:

- homo sap. 0.1%
- Neanderthal 0.3%
- chimp 1.2%
- gorilla 1.6%

important!

a human person is more than genetics or biology

Evolutionary tree based on the molecular clock.
Bridget and Priya, The Conversation, 2017

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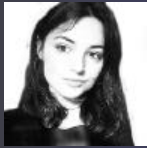
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mt-DNA Eve



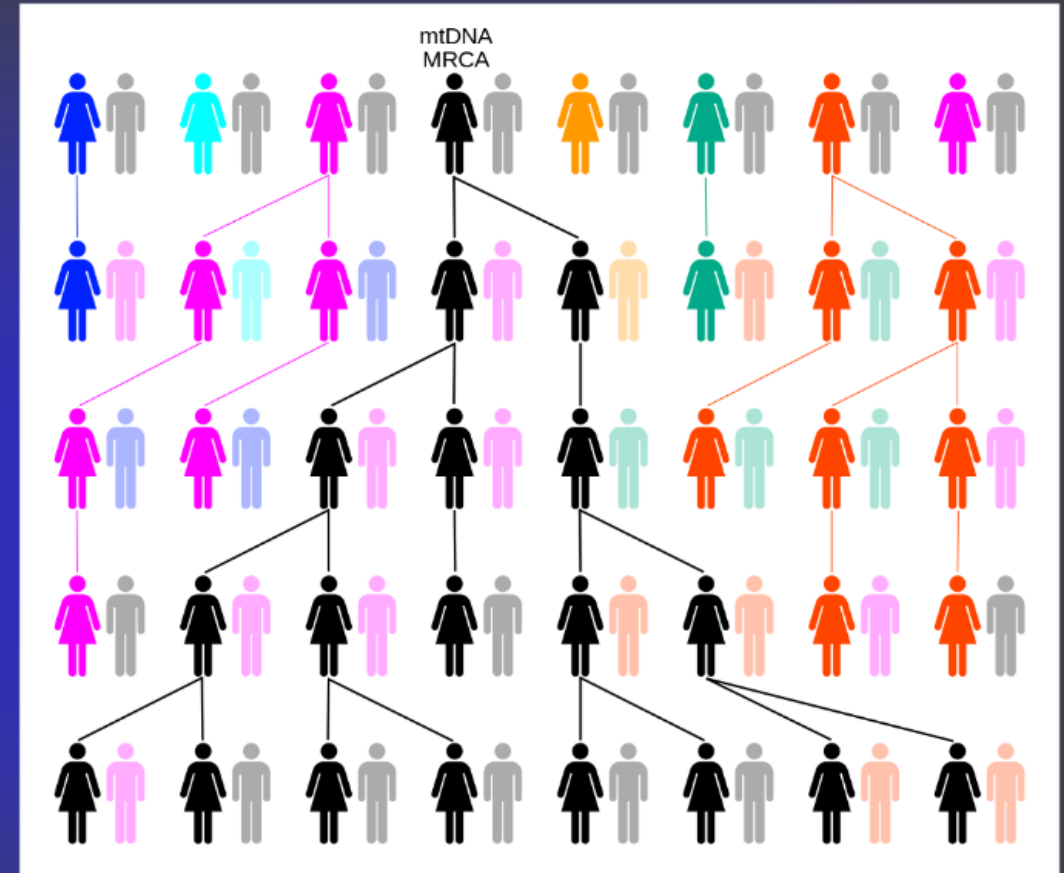
Martina Petkova, History of Yesterday, Aug. 10, 2020

She's our most recent common female ancestor.

The woman whose mitochondrial DNA has been passed down thousands of generations and currently can be found in every single human being on Earth. She wasn't the first woman. She was, however, the woman whose DNA line has not gone extinct.

There is a genetic bottleneck

(*) Chan et al., *Human origins in a southern African paleo-wetland and first migrations*, Nature, 2019, 575, 185-189.



Example chart showing the evolution of mitochondrial DNA | by C. Rottensteiner

Y-Adam and mt-Eve

It is possible to create a genetic family tree with the Y chromosome and mitochondrial DNA.

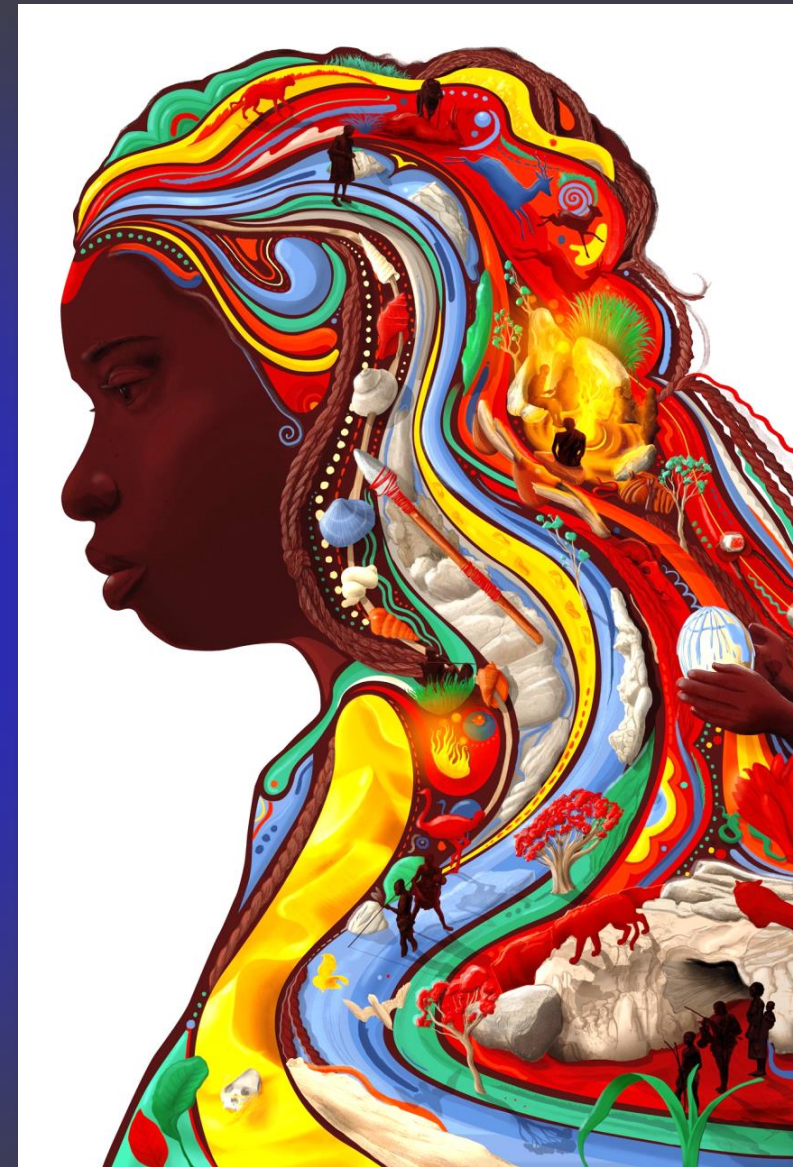
Y- Adam, 250 ka ago;

Petr et al. 2020

mt-Eve, 200 ka ago;

Chan et al 2019

In the mtDNA, there is no genetic code inherited from Neanderthal and other hominins younger than mt-Eve.



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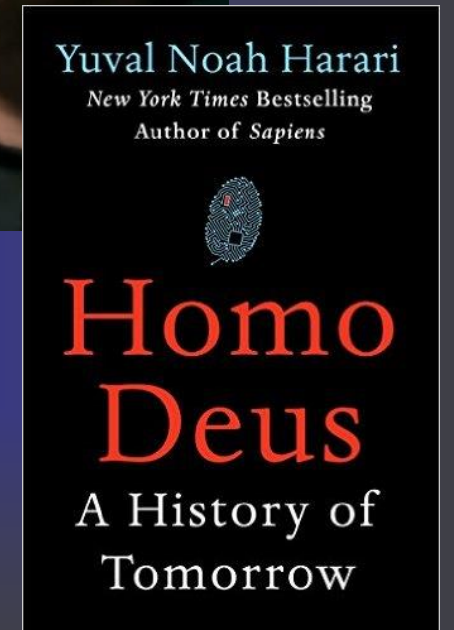
The cultural revolution 70.000 years ago (Harari)

Seventy thousand years ago the Cognitive Revolution transformed the Sapiens mind, thereby turning an insignificant African ape into the ruler of the world.

The improved Sapiens minds suddenly had access to the vast intersubjective realm, which enabled them to create gods and corporations, to build cities and empires, to invent writing and money, and eventually to split the atom and reach the moon.



Yuval Noah, *Homo Deus, A Brief History of Tomorrow*, Penguin Random House, UK.



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The striking genetic continuity

There is genetic continuity between humans and hominins like Neanderthals, and between humans before and after genetic bottleneck.

Conclusion: biology and genetics are not sufficient to explain the difference



St. John H. Newman (1863)

It is as strange that monkeys should be so like men, with no historical connection between them, as that there should be no course of facts by which fossil bones got into rocks.

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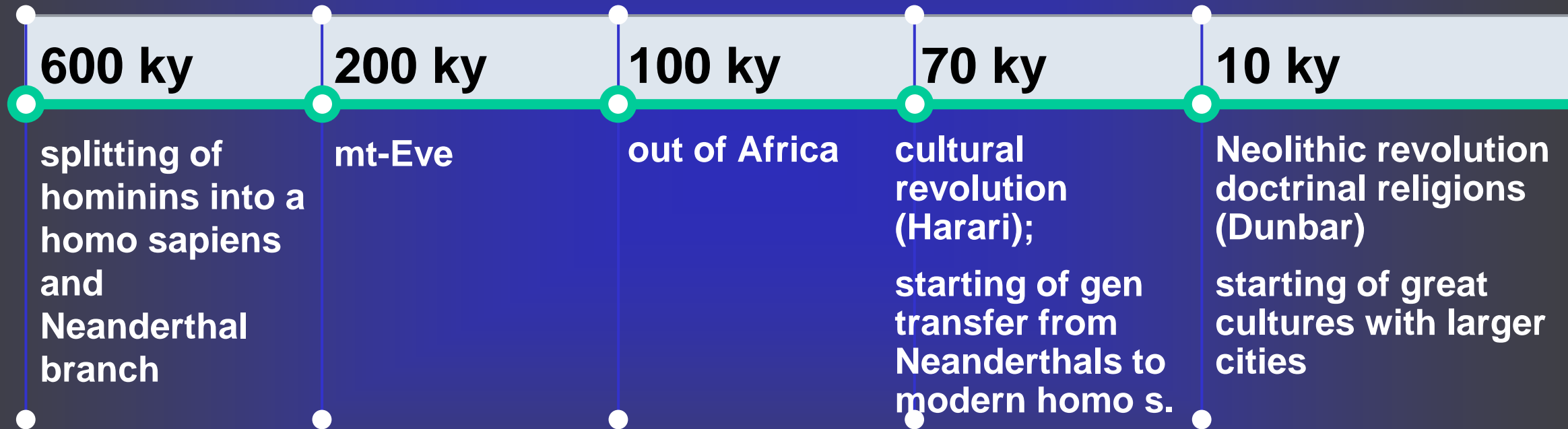
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Timeline of homo sapiens

the big question: when lived the first human person?



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Genesis statements

- Genesis 1, 26

God created man in the image of himself, in the image of God he created him, male and female he created them.

- Genesis 2, 23

And the man said: This one, at last, is bone of my bones and flesh of my flesh! She is to be called Woman because she was taken from Man.

- Genesis 3, 20

The man named his wife 'Eve' because she was the mother of all those who live.

Conclusion:

There is a first pair of human persons: husband and wife



Theological versus biological polygenism



Ratzinger,
lecture notes 1964,
quoted in S. Sanz, *Revista*
Española de Teología, 78
(2018) 433-457

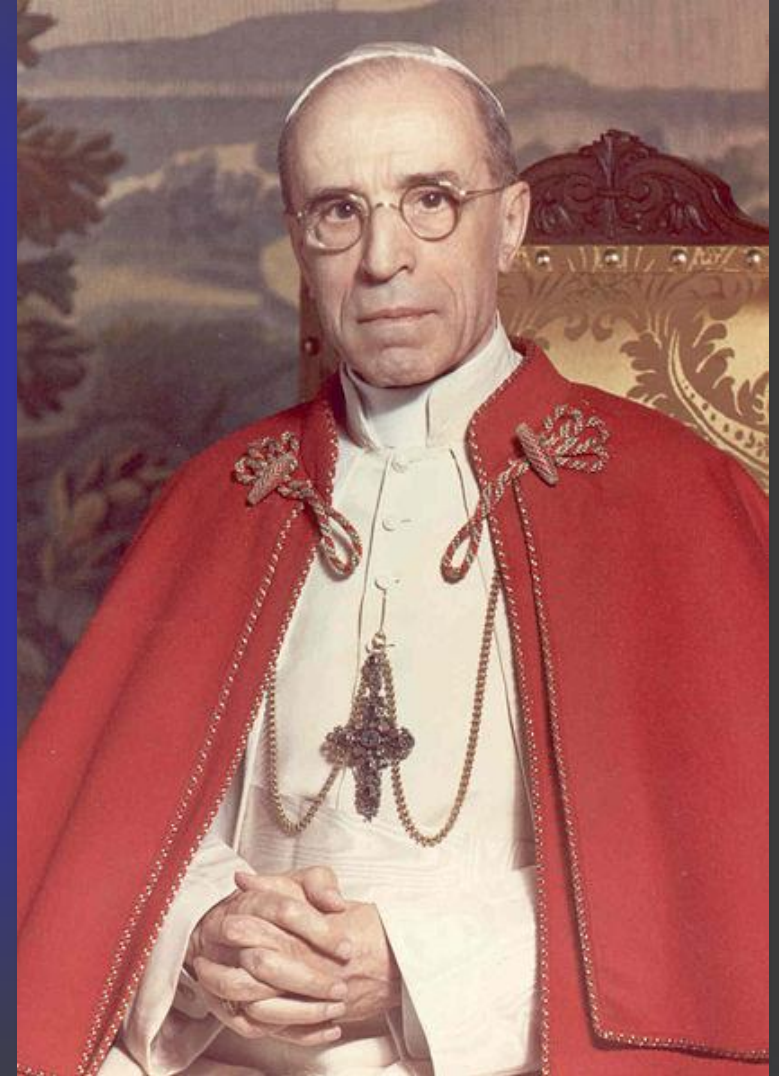
The process of becoming human lies in its inner depth outside of the biologically measurable. That means: One may assume a highly probable result that hominization in the biological stock originated polygenistically.

Even then, the possibility remains that the ingenious lightning (Blitz) to think transcendence - happened for the first time in one or two individuals. Biological polygenism and theological monogenism are not necessarily mutually exclusive opposites because their level of questioning does not entirely coincide.

Pius XII, Humani generis (12-8-1950) I

The faithful cannot embrace that opinion which maintains that either after Adam there existed on this earth true men who did not take their origin through natural generation from him as from the first parent of all, or that “Adam” signifies a certain number of first parents.

Now it is in no way apparent how such an opinion can be reconciled with that which the sources of revealed truth and the documents of the Teaching Authority of the Church propose with regard to original sin, which proceeds from a sin actually committed by an individual Adam and which, through generation, is passed on to all and is in everyone as his own.



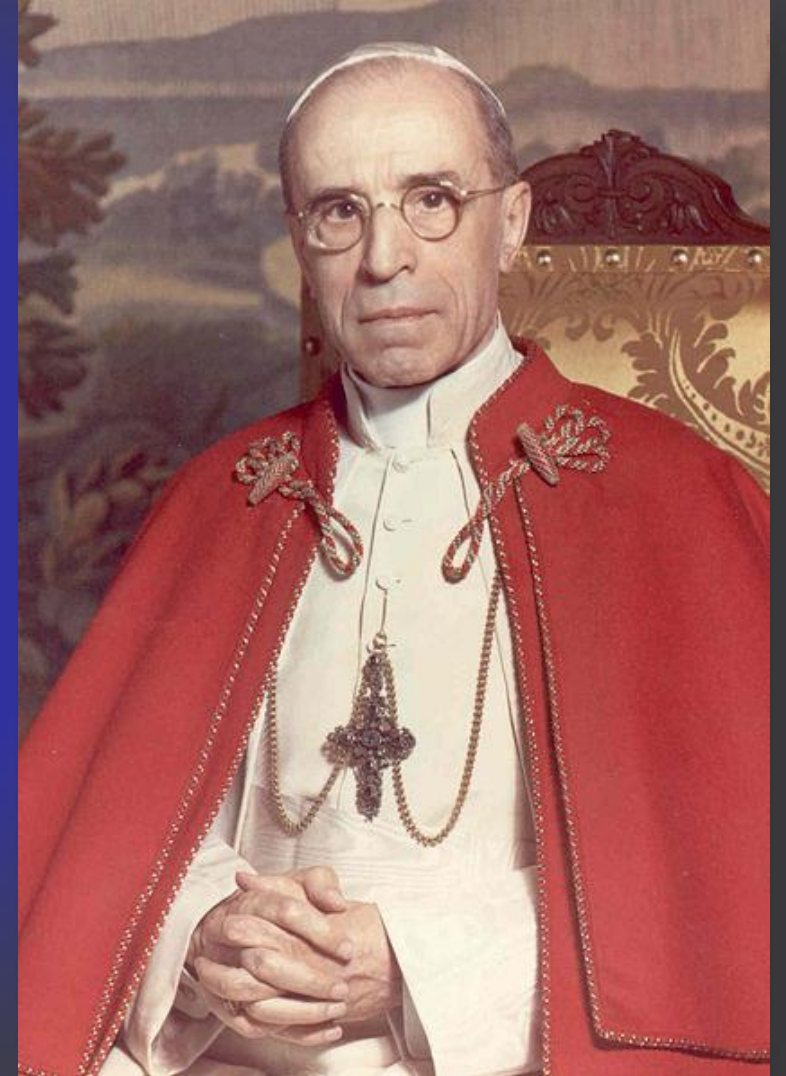
Pius XII, Humani generis (12-8-1950) II

In a papal audience of 4-7-1950 to consultors
(regarding the final text of the encyclical)

There was no need for any clarification of the quoted passage from the encyclical, the formulation of which was deliberately cautious and it is good for it to remain as it is, without any further clarifications, except —of course—the absolute “irreformability” of the dogma of original sin in the descendants of Adam. The two cardinals (Ciriaci and Ottaviani) rightly observed that “one needs to be very careful in the matter, as the words of the encyclical are.”

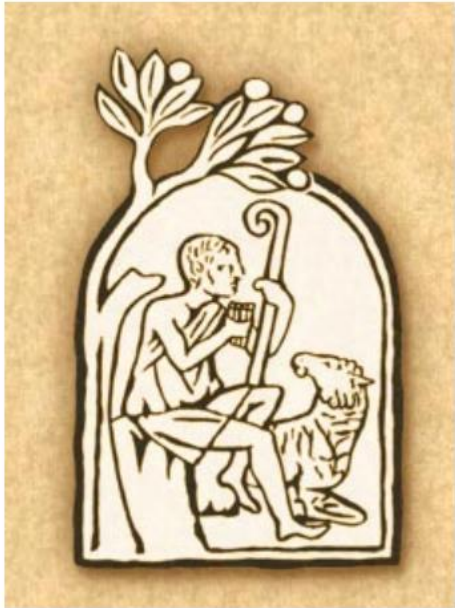
(ADDF 1950b, fol. 70v & 72)

quoted by **K.W. Kemp** *Humani Generis & Evolution: A Report from the Archives*, *Scientia et Fides* 11(1) 2023



Catholic Doctrine about the descendants

**Compendium
OF THE
CATECHISM
OF THE
CATHOLIC CHURCH**



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#7 From the very beginning, God manifested himself to our first parents, Adam and Eve, and invited them to intimate communion with himself. After their fall, he did not cease his revelation to them but promised salvation for all their descendants.

#76 Because of the original unity of all human beings, it (*the original sin*) is transmitted to the descendants of Adam “not by imitation, but by propagation”. This transmission remains a mystery which we cannot fully understand.

Lateran Council IV (1215)

Deus...creator omnium visibilium et invisibilium, spiritualium et corporalium: qui sua omnipotenti virtute simul ab initio temporis utramque de nihilo condidit creaturam, spiritualem et corporalem, angelicam videlicet et mundanam: ac deinde humanam, quasi communem ex spiritu et corpore constitutam.

God...creator of all visible and invisible things, of the spiritual and of the corporal; who by His own omnipotent power at once from the beginning of time created each creature from nothing, spiritual and corporal, namely, angelic and mundane, and finally the human, constituted as it were, alike of the spirit and the body (Denz 428).

- Genesis 1, 1

In the beginning God created the heavens and the earth.

Provincial council of German bishops in Cologne (1960)

Catholic Reaction to Evolution from the mid-1800s (Part 1)

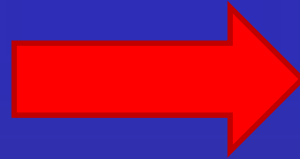
1859 The appearance of Charles Darwin's *Origin of Species*

1860 Provincial council of German bishops in Cologne

- The first parents were created directly by God

- The claim that the body of man came to be by a spontaneous change from imperfect nature to the most perfect and, in a continuous process finally became human is contrary to Scripture and to the faith

Tentative solution of the puzzle



stained glass window in the Cathedral of Brussels

Tentative solution of the puzzle

There is a genetic bottleneck with mt-Eve

biologically nothing special, but only her descendants survived and became 8.000.000.000 individuals today

She had a husband Adam (not Y-Adam)

He is the father of all children of mt-Eve

All now living humans are descendants of mt-Eve and Adam

Evidence for interbreeding of descendants of mt-Eve with other hominins

this is still visible in the DNA of the majority of all present-day humans

Like the descendants of mt-Eve and Adam, also offspring of human persons are human persons, even if one of the parents is a hominin (e.g., Neanderthal).

Acknowledgments

**Discussion with Juleon Schins about his book:
Adam and Eve Vindicated**

Publications and discussion with Antoine Suarez

**Many of the images are taken from the internet,
especially from Wikipedia.**