

Culture  **Christianity**



Intown
Community
Church



Creation and Evolution

Week 3: Evolution—Key Claims



Defining Our Terms

Listening—and Speaking—Well

creation (little c)

- 1. The act of making something or bringing it into being.**
- 2. The act (of a god/s) that brings the universe, the earth, and/or life into being.**

Creation (big C)

God's act of bringing the universe, the earth, and life into existence by his own power, for his own purposes, and all "very good."

evolution (little e)

- 1. Change over time.**
- 2. Genetic change over time.**

Evolution (Big E)

“an unpredictable and natural process of... descent with genetic modification that is affected by natural selection, chance, historical contingencies, and changing environments.”

NABT, 2000

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Creation and Evolution

Three Possible Approaches





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507 507

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Imagination, beliefs, values
What makes life worth living

Reason, facts
Actual living

God wants to use us

~~We need~~ to re-enchant
our world.



The book of revelation and the book of nature are both from God, and will be found, when both are adequately interpreted, to coincide perfectly.

A.A. Hodge, *The Westminster Confession: A Commentary*



E/evolutionary Perspectives

Fundamental Agreement with Christian
Perspectives on Creation

There is a **staggering**
diversity of life in our world.
Understanding how this
came to be is worthwhile,
even wonder-full.

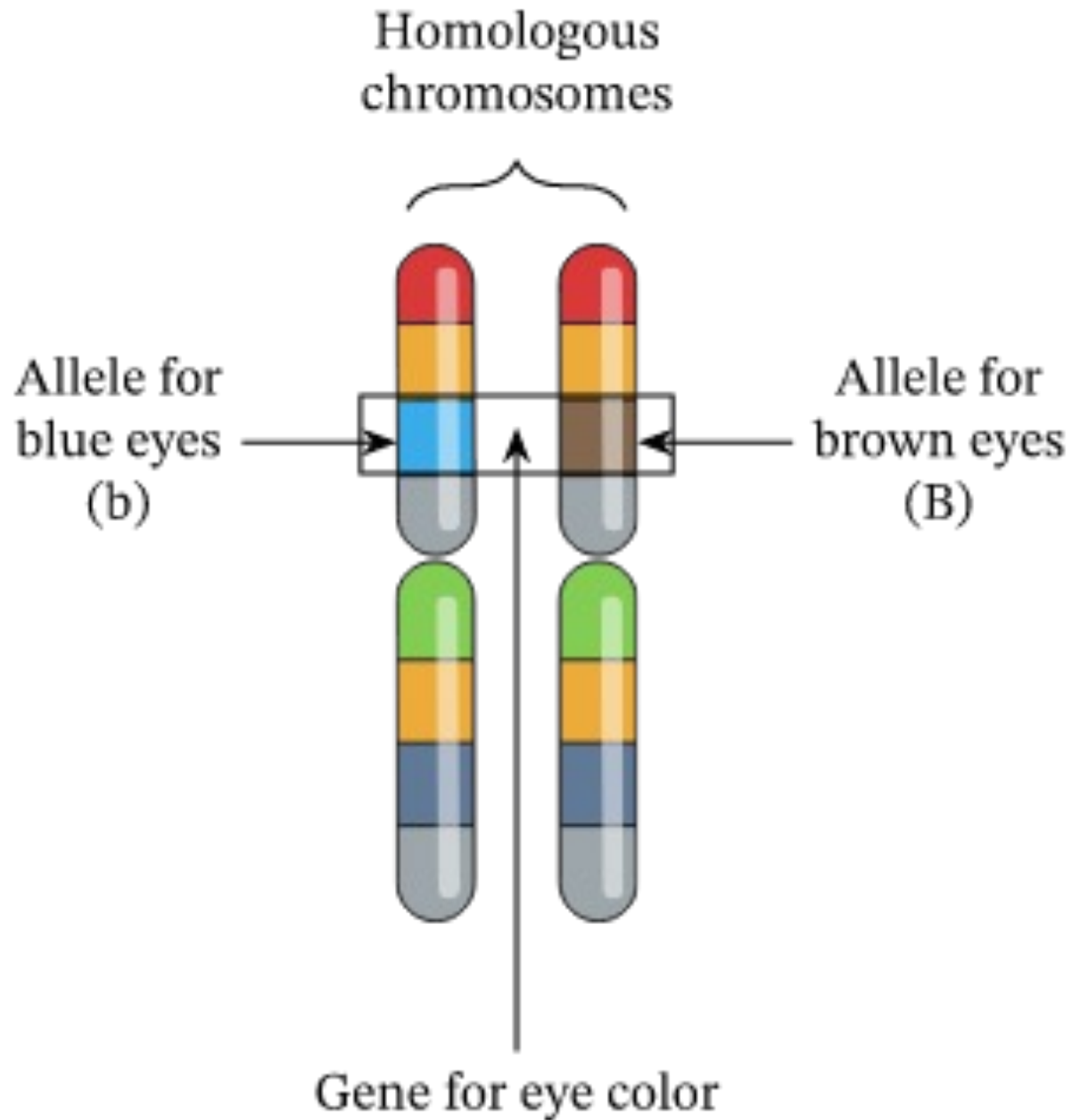
The natural world operates according to many consistent processes, principles, and patterns.

Observing these allows us to account for many aspects of reality.

Microevolution* is an observable feature of the natural world.

***Adaptations resulting in “changes in the frequency of gene versions” in a population.**

E. Quin



Wait—
what's
an "allele"
again?

“In any population of organisms there is natural variation. Some of these variations will allow the organisms possessing them to survive and reproduce better than those without these particular traits. The successful traits will spread through the population. This **change in the frequency of alleles in the population is evolution.**”

[Natural Selection - Biology LibreTexts](#)

Mutation
Gene flow
Genetic drift
Natural selection

[Understanding Evolution \(berkeley.edu\)](https://www.berkeley.edu)

...When **natural selection** is occurring, some individuals are having better reproductive success than others. Alleles are being passed to the next generation in frequencies that are different from the current generation.”

[Natural Selection - Biology LibreTexts](#)



Evolutionary Perspectives

Fundamental Opposition to Christian
Perspectives on Creation

**The universe is naturalistic,
materialistic.**

**Nothing exists besides
matter-in-nature.**

All available evidence supports the central conclusions of evolutionary theory, that life on Earth has evolved and that species share common ancestors. ...All sciences ask questions about the **natural** world, propose explanations in terms of **natural** processes, and evaluate these explanations using evidence from the **natural** world.

[The big issues - Understanding Evolution \(berkeley.edu\)](http://berkeley.edu)

Evolutionary biology is no exception. Darwin's basic conception of evolutionary change and diversification... explains many observations in terms of **natural** processes and is supported by evidence from the **natural** world.

[The big issues - Understanding Evolution \(berkeley.edu\)](http://berkeley.edu)

The primary force shaping
our universe, and life itself is
Chance—randomness
without purpose or design.

**There is no (knowable) First
Cause.**

1. Although in relation to the foreknowledge and decree of God, the first cause, all things come to pass immutably and infallibly, yet, by the same providence, He ordereth them to fall out according to the nature of **second causes**.....

2. God, in His **ordinary** providence, maketh use of **means**, yet is free to work without, above, and against them, at His pleasure.

Westminster Confession of Faith, Chapter 5, "Of Providence"

Anything that exists simply IS,
so there is no transcendent
basis for saying what is good or
bad.

**Concepts of good are species-
centric or species-specific.**

Human beings are essentially the same as any other animal.

Consciousness and intelligence are distinctive traits, not transcendent gifts.

Over the last several centuries individuals have been told that they are simply cosmic accidents, adrift on a planet on the edge of an empty universe, ...that our motivations, interests, and desires are simply programmed into us as biological instincts.

Mark Sayers, *Disappearing Church*,
citing the work of sociologist Warren Susman

God wants to use us

~~We need~~ to re-enchant
our world.

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John 1:1-4

The Word Became Flesh

1 In the beginning was the Word, and the Word was with God, and the Word was God. 2 He was with God in the beginning. 3 Through him all things were made; without him nothing was made that has been made. 4 In him was life, and that life was the light of all mankind.

What did God actually say when he spoke the world into existence?

My physicist father's chalkboard

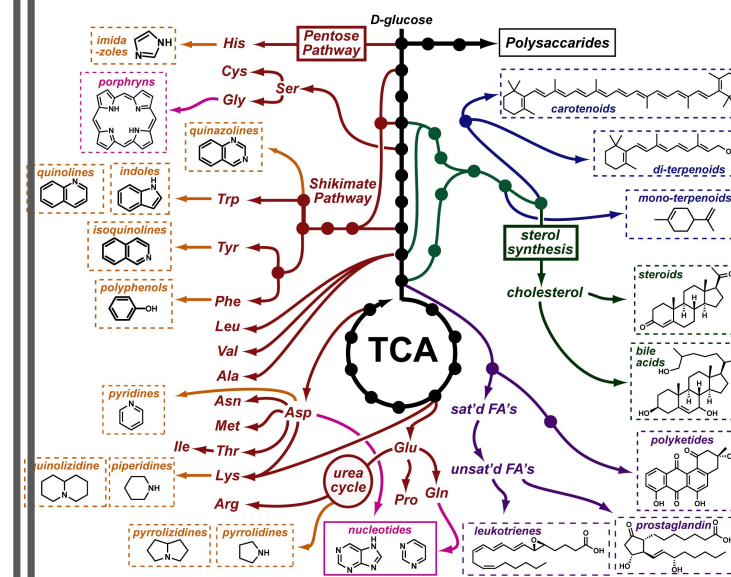
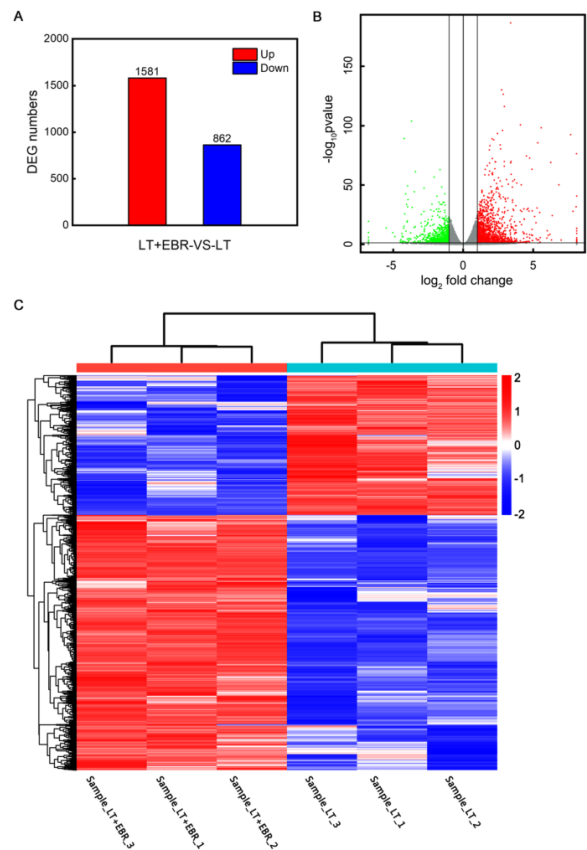
$\langle \phi_n | \phi_m \rangle = \langle \phi_n | \int dx |x\rangle \langle x| \phi_m \rangle$ $\psi_a - \psi_b = 0, \pi, \dots \Rightarrow e^{i\psi_a} = e^{i\psi_b}$ $\{ |R\rangle, |L\rangle \}$ $\{ | \psi \rangle = \sqrt{K} | \phi \rangle \}$
 $\phi_n(x) = \langle x | \phi_n \rangle$ $\phi_n'(x) = \phi_n / x$ $\psi_0(x) = \frac{1}{\sqrt{\pi L}} e^{i\psi_0} \left(e^{i(\frac{\pi}{2L}n + k_0)x} + e^{-i(\frac{\pi}{2L}n + k_0)x} \right)$ $\rho = \frac{h}{2\pi}$
 $\langle \phi_n | \phi_n \rangle = \int_{-L/2}^{L/2} dx |\phi_n(x)|^2 = \int_{-L/2}^{L/2} dx \frac{1}{L} = 1$ $= \frac{2}{\sqrt{2L}} e^{i\psi_0} \cos \left[\left(\frac{\pi}{2L}n + k_0 \right) x \right]$ $\psi_0(x \pm \frac{L}{2}) = 0$ $\begin{cases} \psi_0 = \frac{h}{2\pi} \\ \psi_0 = 0 \\ \psi_0 = \pi \end{cases}$
 $\langle \phi_n | \phi_m \rangle = \langle \phi_n | \int dx |x\rangle \langle x| \phi_m \rangle \Rightarrow \left(\frac{\pi}{2L}n + k_0 \right) \frac{L}{2} = \frac{\pi}{2} (2l-1), l=1, 2, \dots \Rightarrow k_0 = -\frac{\pi}{2L}$
 $\langle \phi_n | \phi_m \rangle = \int_{-L/2}^{L/2} dx \phi_n^*(x) \phi_m(x)$ $\psi_n(x) = \sqrt{\frac{2}{L}} \cos \left[\frac{\pi}{2L} (2n-1)x \right]$ $\psi_n(x) = \sqrt{\frac{2}{L}} \sin \left[\frac{\pi}{2L} nx \right]$
 $\langle \phi_n | \phi_m \rangle = \frac{1}{L} \int_{-L/2}^{L/2} dx e^{-ikx} e^{ik'x} \stackrel{!}{=} 0; k \neq k'$ $\hat{H} \psi_n(x) = -\frac{\hbar^2}{2m} \partial_x^2 \psi_n(x) = \frac{\hbar^2}{2m} \left(\frac{\pi}{2L} (2n-1) \right)^2 \psi_n(x)$
 $E_n = \frac{\hbar^2}{2m} \frac{\pi^2}{L^2} (2n-1)^2, n=1, 2, \dots$ $\hat{H} \psi_n(x) = \frac{\hbar^2}{2m} \left(\frac{\pi}{L} \right)^2 n^2 \psi_n(x)$
 $|\psi_0\rangle = |\psi_0\rangle e^{-\frac{(x-x_0)^2}{2a^2}}$ $\int_{-\infty}^{\infty} dx e^{-\frac{x^2}{2a^2}} = \sqrt{\frac{\pi}{2}}$ $A = \frac{1}{2a^2} \Rightarrow |\psi_0\rangle = \frac{1}{\sqrt{2\pi a^2}} e^{-\frac{x^2}{2a^2}}$ $a \geq 10^{-10} \text{ m}$
 $\hat{H} \psi_0 = -\frac{\hbar^2}{2m} \partial_x^2 \psi_0(x) = \frac{\hbar^2}{2m} \frac{1}{a^2} \psi_0(x) - \frac{\hbar^2}{2m} \frac{1}{a^2} (x-x_0)^2 \psi_0(x)$
 $= -\frac{\hbar^2}{2m} \left(-\frac{1}{a^2} + \left(\frac{2}{a^2} (x-x_0) \right) e^{-\frac{(x-x_0)^2}{2a^2}} \right) \psi_0$ $V(x) = \frac{1}{2} m \omega^2 (x-x_0)^2 \rightarrow m \omega^2 = \frac{\hbar^2}{m a^2} \Rightarrow \omega = \frac{\hbar}{2ma}$
 $\hat{H} \rightarrow \hat{H} = -\frac{\hbar^2}{2m} \partial_x^2 + V(x)$ $\hat{H} \psi_0 = \frac{\hbar^2}{2m} \frac{1}{a^2} \psi_0 = E_0 \psi_0$
 $E_0 = \frac{\hbar^2}{2m} \frac{1}{2a^2}$
 $[\hat{p}, \hat{x}] = \frac{\hbar}{i}; \hat{p} = \frac{\hbar}{i} \partial_x / \hat{H} = \frac{\hbar^2}{2m} + \frac{1}{2} m \omega^2 \hat{x}^2$
 $a^2 + b^2 = (a+ib)(a-ib); a, b \in \mathbb{R}; 2(a\hat{p} + ib\hat{x})(a\hat{p} - ib\hat{x}), a, b \in \mathbb{R}$
 $= a^2 \hat{p}^2 + iba \hat{p} \hat{x} - iab \hat{x} \hat{p} + b^2 \hat{x}^2 = a^2 \hat{p}^2 + b^2 \hat{x}^2 - ba \hat{x} \hat{p} + ba \hat{p} \hat{x}$
 $\hat{H} = (a\hat{p} + ib\hat{x})(a\hat{p} - ib\hat{x}) + ba \hat{x} \hat{p}; a^2 = \frac{\hbar^2}{2m}; b^2 = \frac{1}{2} m \omega^2$
 $D = \frac{1}{\sqrt{2a\omega}} (a\hat{p} + ib\hat{x}); D^\dagger = \frac{1}{\sqrt{2a\omega}} (a\hat{p} - ib\hat{x}) \Rightarrow \hat{H} = \hbar \omega D^\dagger D$
 $\left(\begin{matrix} \omega & 0 \\ 0 & -\omega \end{matrix} \right) \left\{ \begin{matrix} 1 \\ 0 \end{matrix} \right\}; \text{SU}(2) \text{ or } S^3$ $A \rightarrow \omega \hat{A} \omega^{-1} + \frac{1}{2} \hbar \omega$
 $\int dx |\psi_0\rangle \langle \psi_0| = \int dx \frac{1}{\sqrt{2\pi a^2}} e^{-\frac{x^2}{2a^2}} \frac{1}{\sqrt{2\pi a^2}} e^{-\frac{x^2}{2a^2}} = \int dx \frac{1}{2\pi a^2} e^{-\frac{x^2}{a^2}} = 1$
 $\int dx |\psi_0\rangle \langle \psi_0| = \int dx \frac{1}{\sqrt{2\pi a^2}} e^{-\frac{x^2}{2a^2}} \frac{1}{\sqrt{2\pi a^2}} e^{-\frac{x^2}{2a^2}} = \int dx \frac{1}{2\pi a^2} e^{-\frac{x^2}{a^2}} = 1$

A SCIENTIST PRESENTS
EVIDENCE FOR BELIEF

THE
LANGUAGE
OF GOD

FRANCIS S. COLLINS

Book by Francis Collins, former
NIH Director (2006)



Genome-transcriptome-proteome-metabolome

Human attempt to catalog all the biological languages of God

(Database of databases—the National Center for Biotechnology Information)

All Databases Search

NCBI Home
Resource List (A-Z)
All Resources
Chemicals & Bioassays
Data & Software
DNA & RNA
Domains & Structures
Genes & Expression
Genetics & Medicine
Genomes & Maps
Homology
Literature
Proteins
Sequence Analysis
Taxonomy
Training & Tutorials
Variation

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Popular Resources
PubMed
Bookshelf
PubMed Central
BLAST
Nucleotide
Genome
SNP
Gene
Protein
PubChem

NCBI News & Blog
Announcing the GenBank and SRA Data Processing Webpage
10 Jan 2023
Interested in understanding how sequence data are submitted

Next Phase of the NIH Preprint Pilot Launching Soon
09 Jan 2023
Phase 2 expands the scope of the preprints included in PubMed and PMC

Updated bacterial and archaeal reference genomes collection now available!
06 Jan 2023
An updated bacterial and archaeal

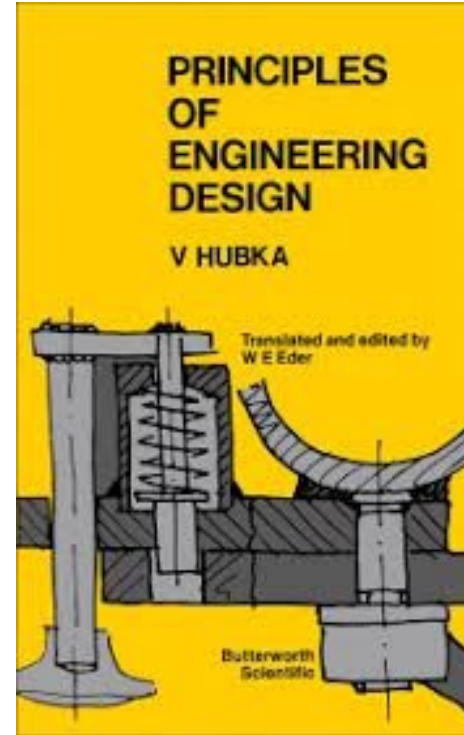
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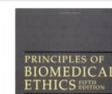
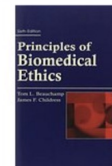
Gen 2:19-20

Now the Lord God had formed out of the ground all the wild animals and all the birds in the sky. He brought them to the man to see what he would name them; and whatever the man called each living creature, that was its name. 20 So the man gave names to all the livestock, the birds in the sky and all the wild animals.

When we pursue truth in any field,
we bump into God's creation



Bioethics



The tools: Principles

- **Autonomy** a person's right to determine what happens to their own body, and also to another person's obligation to respect that right
- **Beneficence** the duty to act in a way that promotes a 'good' for another
- **Non-maleficence** the duty to act in a way that does not cause or further harm
- **Justice (Distributive)** the need to craft allocation systems that distribute scarce resources in a fair and just manner

Biotechnology and medical technology give the illusion of control



Reality: God is just as involved (aka needed) in creating a child or healing someone from disease when medical technology is used.

We are sub-creators and stewards. Our Long Hindsight and Long Foresight enables us to see potential harms and be stewards.

Discovery Science

(Discovering God's Natural Law)

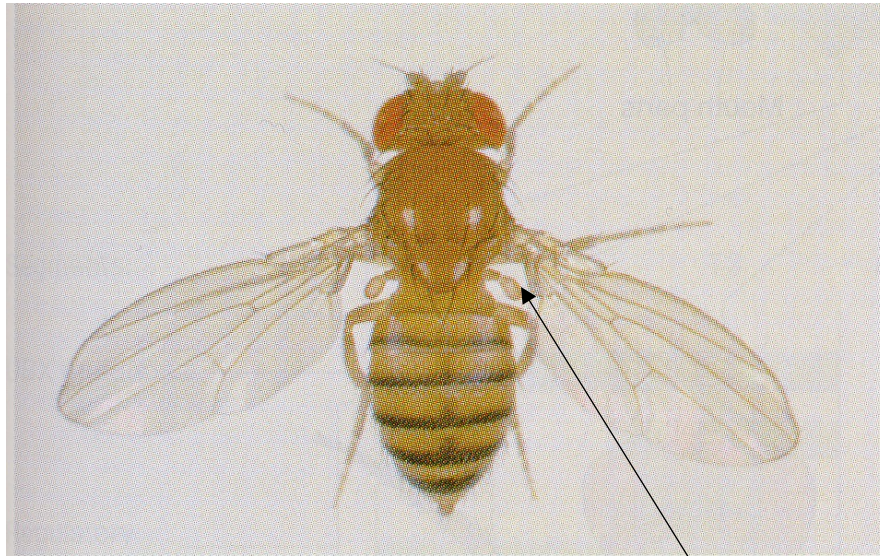
- $E = mc^2$
- photosynthesis:
$$6 \text{ CO}_2 + 6 \text{ H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{ O}_2$$
- Mendel's Principles of Segregation

Applied Sciences

(Discovering God's Mediated Law)

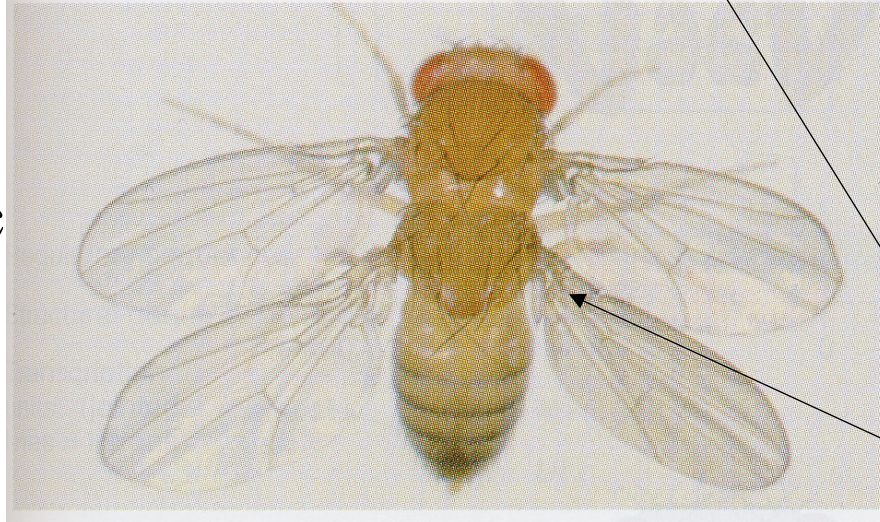
- Regulation 4.7.90: "New construction must ensure no sedimentation run off into nearby streams and lakes".
- Regulation 5.67.89: "If a tree is cut down, a new tree should be planted."
- "Gene editing is limited to therapy (restoring to existing normal alleles) and not enhancement".

Normal
fly



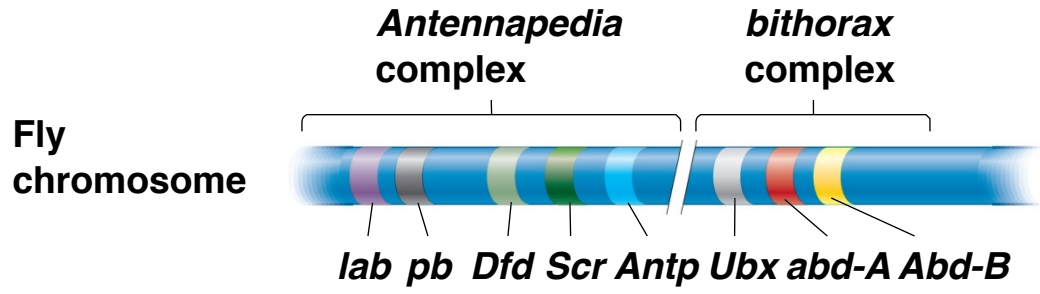
c)

Homeotic
Mutant

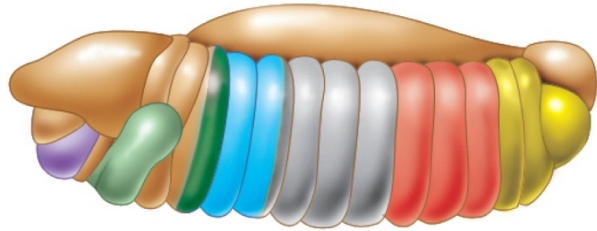


“Master Genes”
control expression of
other genes for a
whole body segment

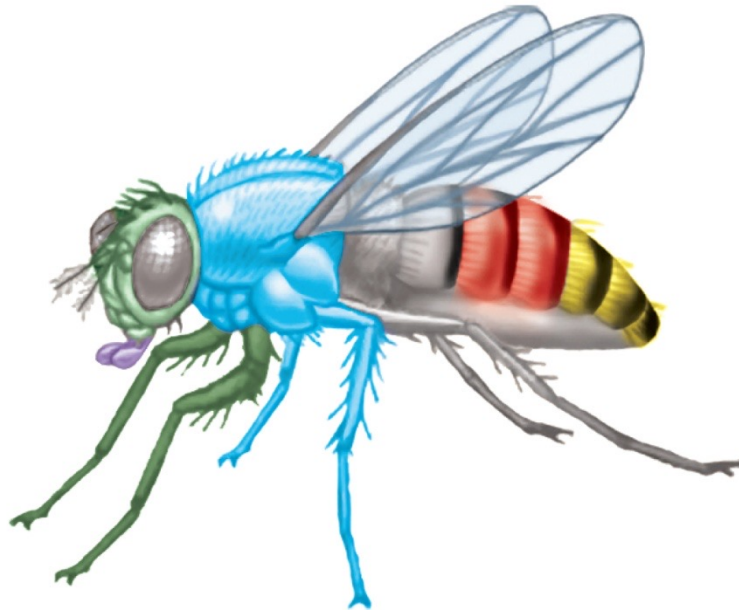
A single gene can determine which
developmental pathway a body segment will
undergo



Embryo
(10 hours)



Adult



***Master* genes are expressed in the body segments they control**

Biological mystery:

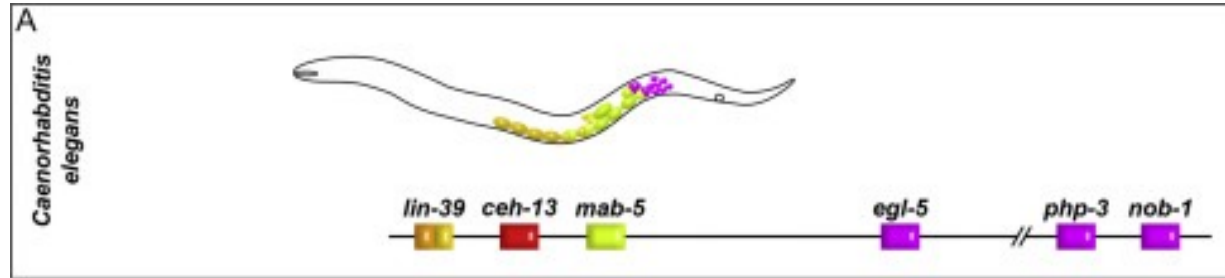
- the order of genes on the chromosome matches the order of expression on the body

Did *Drosophila* evolution include new master gene expression in T3?

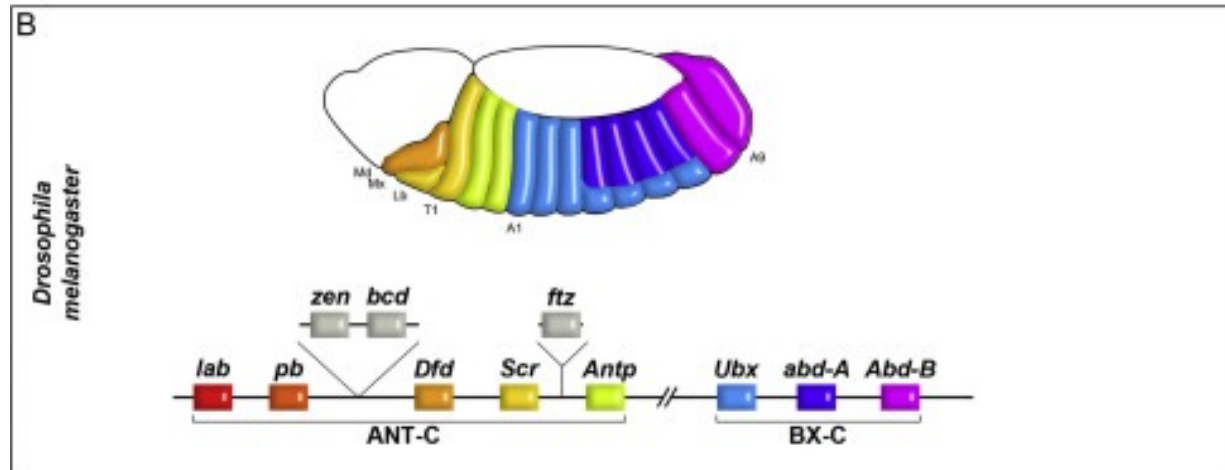


WT dragonflies and butterflies have four sets of wings
Dragonflies and butterflies are evolutionarily older than
Drosophila

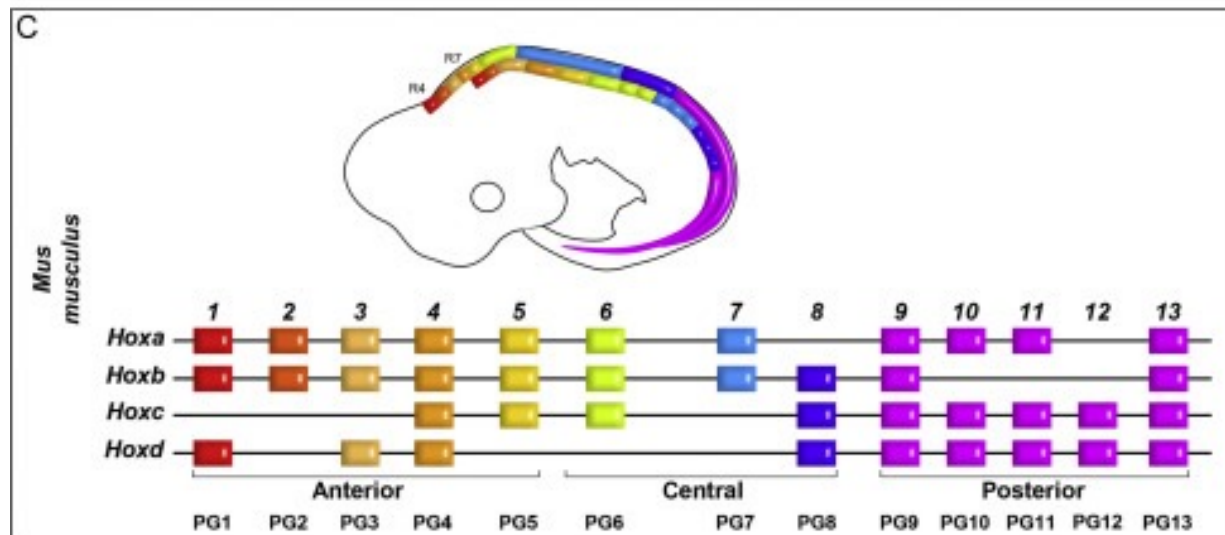
The same master genes are used throughout Creation



Soil worms

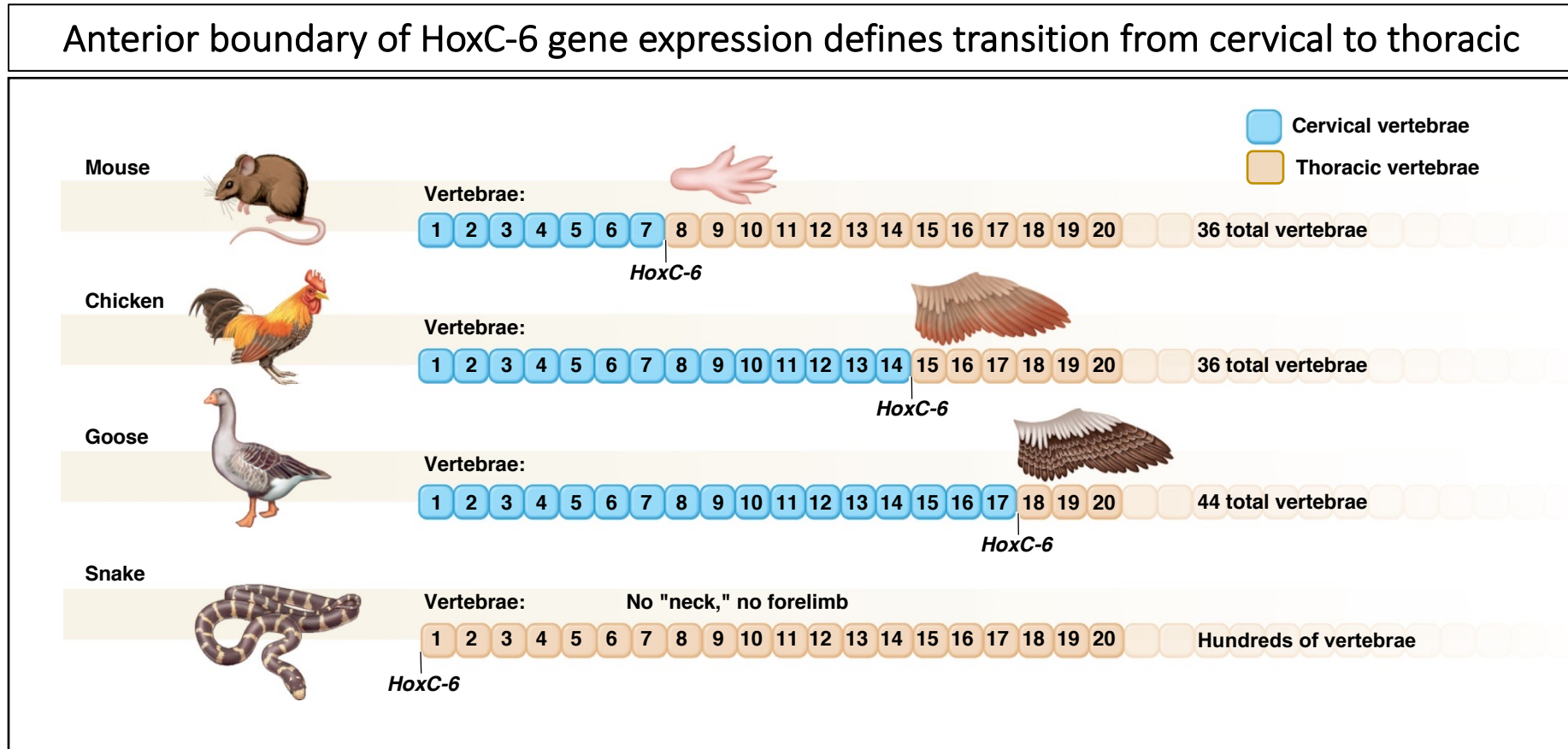


Fruit fly embryo



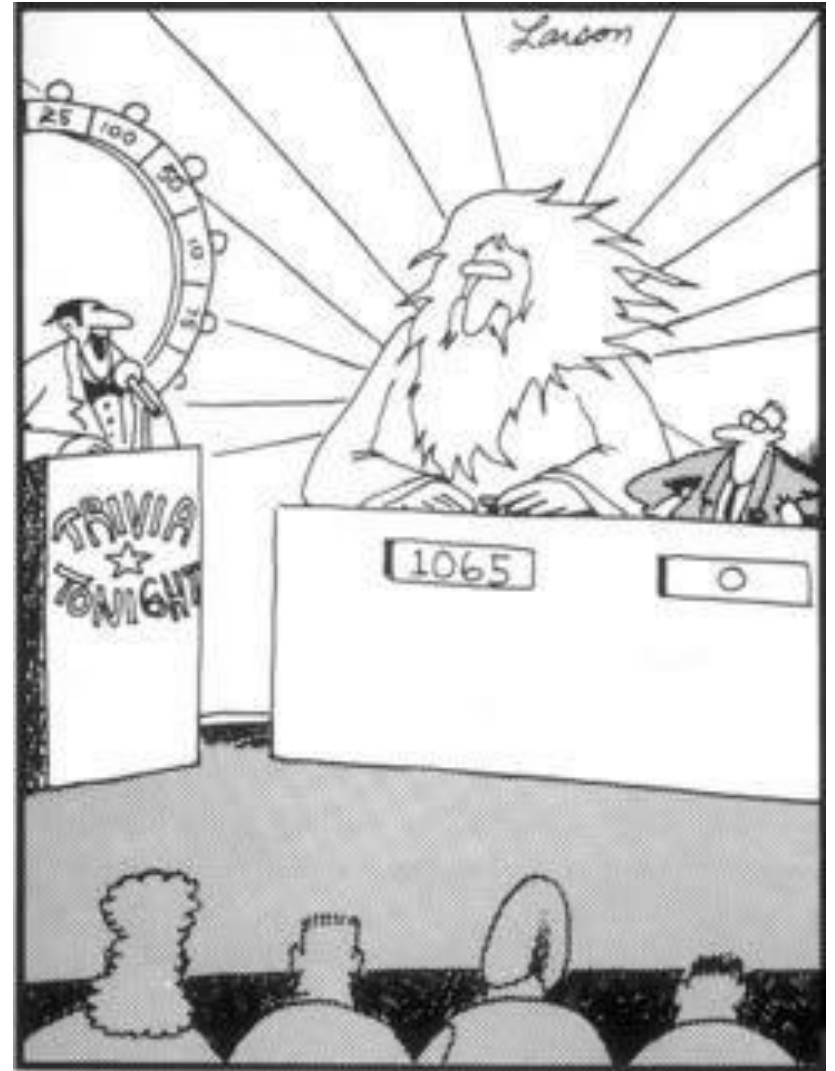
Mouse embryo

Developmental genetic explanation of why the snake has no legs



“Jesus *likes* to hear about molecules...”

Of course He likes to hear about molecules. He wrote the original publication of Creation.



"Yes! That's right! The answer is 'Wisconsin'! Another 50 points for God, and . . . uh-oh, looks like Norman, our current champion, hasn't even scored yet."

God enjoys our discovery and looks forward to us discovering things with Him.

