

**CHRTC 150**  
**Science & Religion:**  
**An Introduction**

**CLASS HANDOUTS**

**Denis O. Lamoureux**

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# NB

Audio-Slide Episode      =      Class Notes Page  
Number                          Number

Abbreviations:

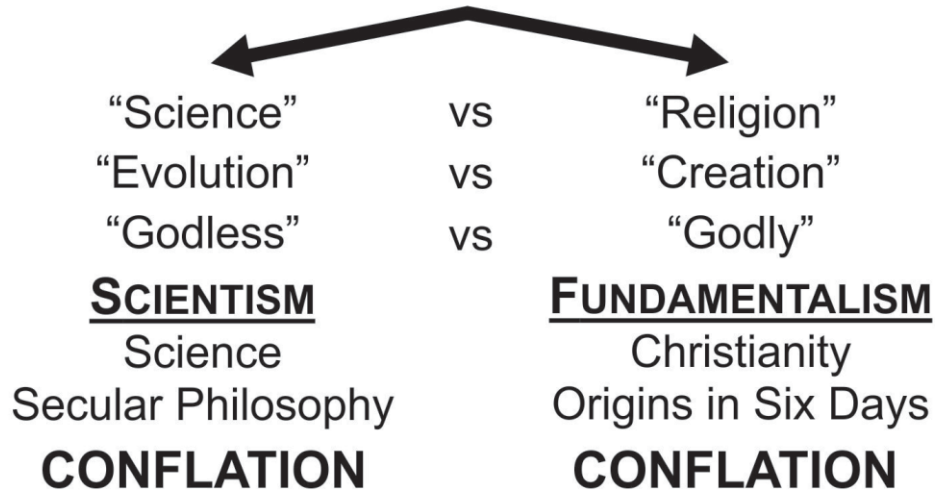
S: Audio-Slide Number

## H: Class Handouts



# SCIENCE & RELIGION WARFARE

## DICHOTOMY



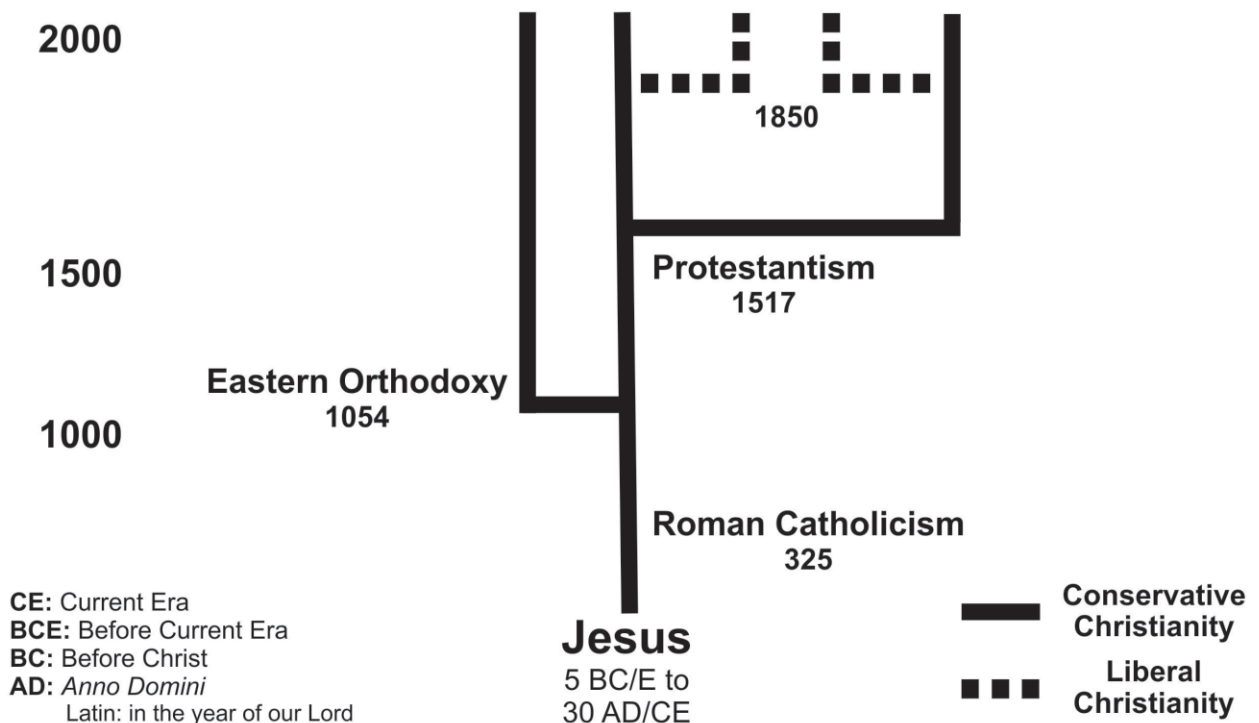
### Scientific Community

*Nature* (1997) & *Science* (1997)

### Religious Community

Pope John Paul II (1996) & Billy Graham (1997)

## CHURCH HISTORY



# CATEGORIES OF DIVINE REVELATION

## Special

- Incarnation  
God revealed himself through Jesus (John 1:1-3, 14)
- Biblical Revelation  
God-breathed & the very words of God (2 Tim 3:16, Rom 3:2)
- Personal Revelation  
Answered prayer, dreams, visions, signs & wonders

## General

- Natural Revelation  
Nature reflects God & his general attributes (Ps 19:1-4, Rom 1:19-20)
- Moral Revelation  
Conscience & law written on the heart (Rom 2:14-15)

# THE TWO DIVINE BOOKS

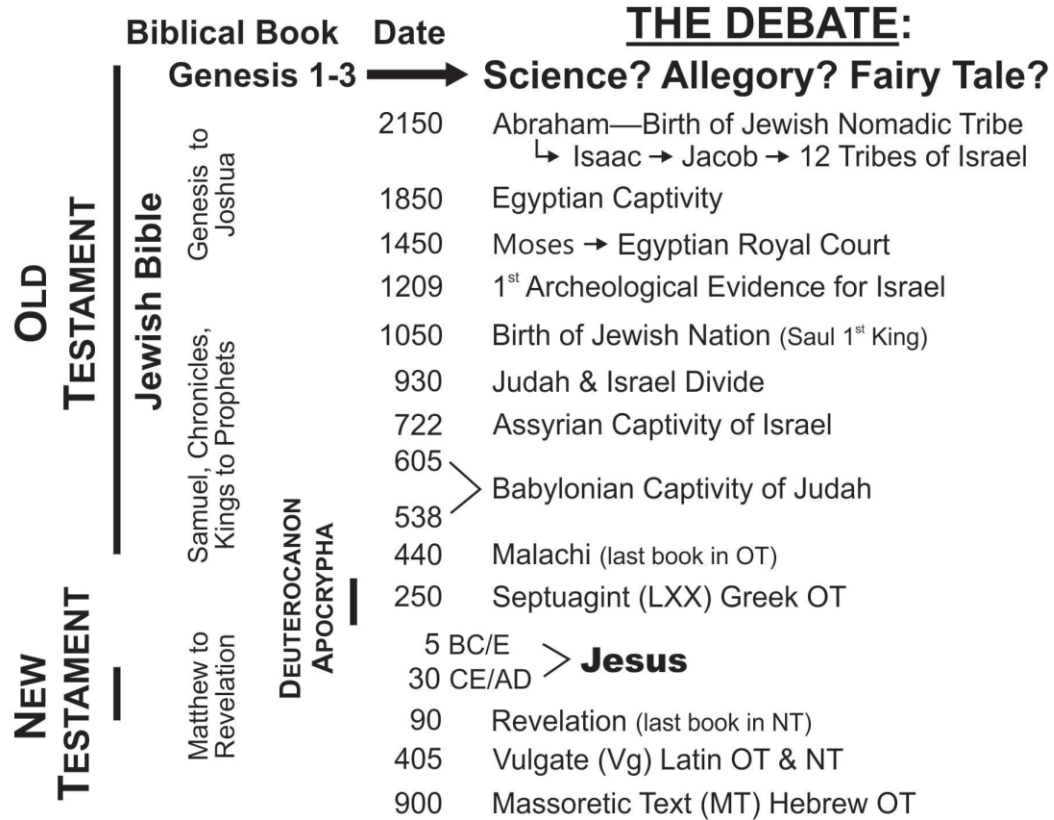
## Book of God's Words

- Verbal Revelation  
Uses Words
- Inspired Writings of the Bible  
God-Breathed & Very Words of God (1 Tim 3:16, Rom 3:2)
- Specific Attributes of God  
Holy (Rev 4:8, Rev 15:4) Love (1 Jn 4:8, 1 Jn 4:16)  
Just (2 Th 1:6, Is 30:18) Merciful (Deut 4:31, Dan 9:9)
- Studied by Theology

## Book of God's Works

- Non-Verbal Revelation  
Does **NOT** Use Words
- Intelligent Design in Nature  
Beauty, Complexity & Functionality
- General Attributes of God  
Creator & Glorious (Ps 19:1)  
Eternal Power & Divine Nature (Rom 1:19-20)
- Studied by Science

# BIBLE OVERVIEW



## CATEGORIES OF DIVINE ACTION

### Personal

#### Interventionism

God raising a dead person to life

#### Providentialism

God working through “nudges” & “co-incidences”

### Cosmological

#### Interventionism

##### Origins

God creating in 6 literal days

##### Operations

God moving planets off their normal course

#### Providentialism

##### Origins

God creating through evolution

*Ordained & Sustained Natural Processes*

##### Operations

God upholding the solar system

*Ordained & Sustained Natural Processes*

# TEN COMMANDMENTS

- |                |              |
|----------------|--------------|
| 1. God #1      | 6. Murder    |
| 2. Idols       | 7. Adultery  |
| 3. Name        | 8. Stealing  |
| 4. Day of Rest | 9. Lying     |
| 5. Parents     | 10. Coveting |

Exo 20:1-17  
Deut 5:5-21

## TWO COMMANDMENTS OF JESUS

**LOVE** the Lord your God with all your heart  
and with all your soul and with all your mind.  
This is the **FIRST** and greatest commandment.

The **SECOND** is like it: **LOVE** your neighbour  
as yourself.

All the Law and the Prophets [Old Testament]  
hang on these **TWO** commandments.

**Matt 22:37-40**  
cf Deut 6:5, Lev 19:18

# THE TWO FOUNDATIONAL PRINCIPLES OF SCIENCE & RELIGION

## METAPHYSICS-PHYSICS PRINCIPLE



## MESSAGE-INCIDENT PRINCIPLE



# EPISTEMOLOGICAL CATEGORIES

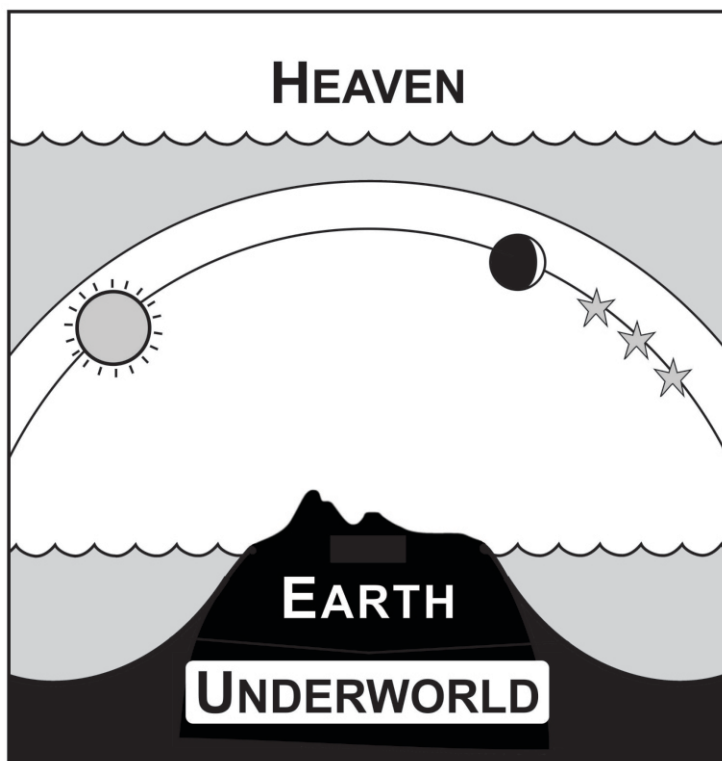
## Foundational

- Correspondence  
Knowledge matches with external reality
- Coherence  
Knowledge is internally consistent & without contradictions
- Consilience  
Knowledge interconnects into one encompassing theory

## Religious

- Divine Foundation of Knowledge  
Knowledge is ultimately rooted in God (Prov 1:7)
- Mystery  
Knowledge that is beyond the human ability to know (1 Cor 13:12)
- Impact of Sin  
Knowledge is influenced by the spiritual state of a person (Rom 1:21-23)

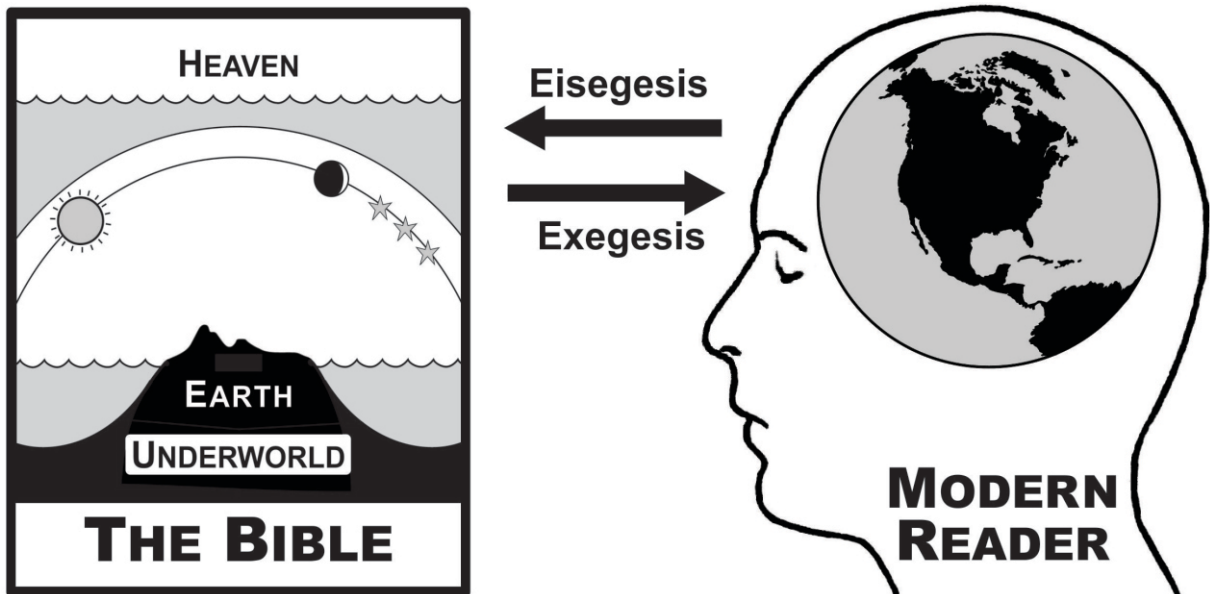
# THE 3-TIER UNIVERSE



## PHILIPPIANS 2:10-11

At the name of Jesus  
every knee should bow,  
[1] in **heaven** and,  
[2] on **earth** and,  
[3] in the **underworld**,  
and every tongue confess  
that Jesus Christ is Lord,  
to the glory of God the  
Father.

# HERMENEUTICAL HORIZONS



## PERSPECTIVES ON THE NATURAL WORLD

**ANCIENT**  
 Unaided  
 Physical Senses  
 Literal & Actual  
 Sun Rising/Setting

**MODERN**  
 Aided by  
 Scientific Instruments  
 Appearance of  
 Sun "Rising/Setting"



**PHENOMENOLOGICAL  
 PERSPECTIVES**



# CATEGORIES OF BIBLICAL STATEMENTS

## SPIRITUAL

- Character of God

God's words are true, perfect & flawless (Prov 30:5, 2 Sam 22:31) God does not lie (Tit 1:2, Heb 6:18)  
Holy (Rev 4:8, Rev 15:4) Love (1 Jn 4:8, 1 Jn 4:16) Just (2 Th 1:6, Is 30:18) Merciful (Deut 4:31, Dan 9:9)

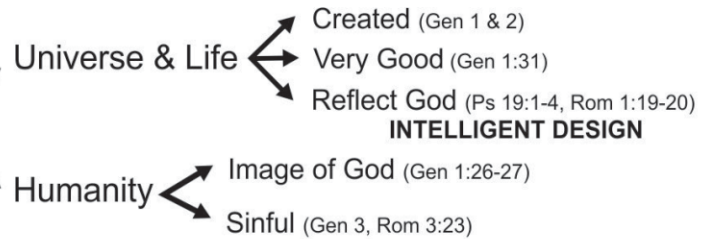
- Laws of God

10 Commandments (Exo 20:1-17, Deut 5:5-21)  
2 Great Commandments (Matt 22:37-40)

- Acts of God



- Character of God's Creation



## SCIENTIFIC

- Structures

- **3-Tiered Universe**

At the Name of Jesus every knee should bow  
in heaven, and on earth and in the underworld (Phil 2:10)

- Operations

- **Immobility of the Earth**

The world is firmly established, it cannot move (1 Chr 16:30, Ps 93:1, Ps 96:10)

- **Mobility of the Sun**

The sun rises and the sun goes down, and hurries to the place where it rises (Eccl 1:5)

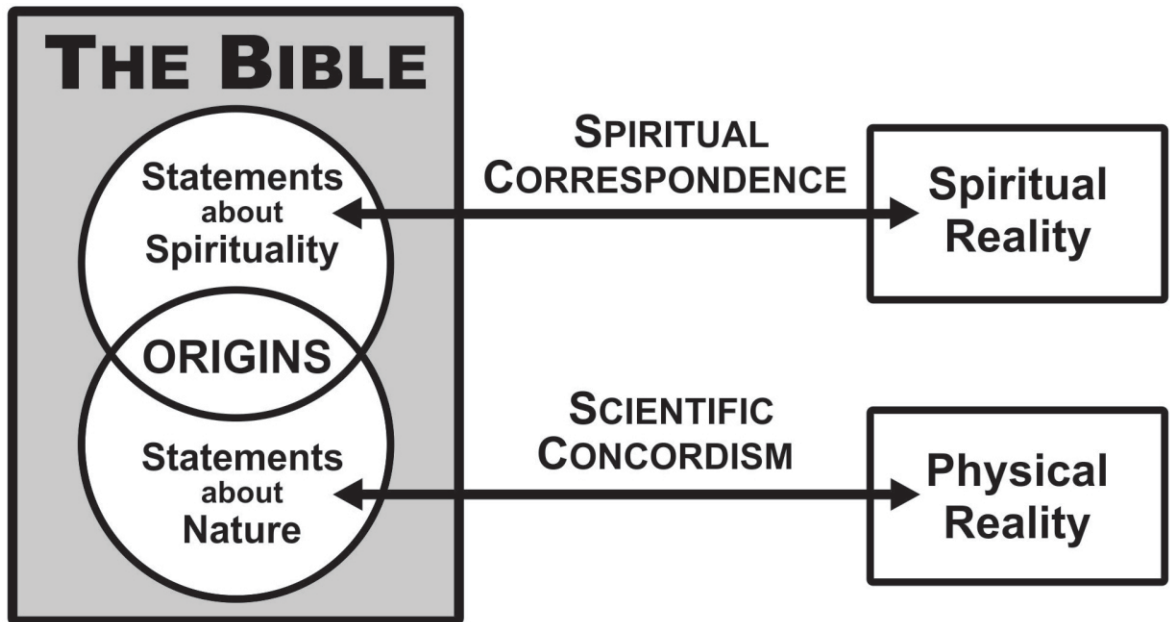
- **ORIGINS**

- **Heavens, Earth & Living Organisms**

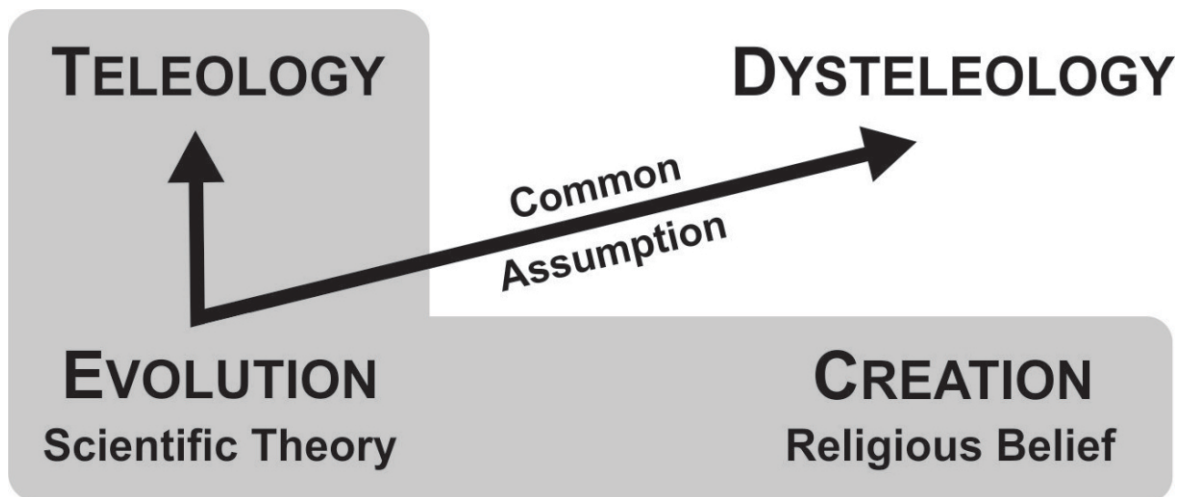
Creation of World in 6 Days (Gen 1)  
Creation of Adam & Eve (Gen 2)



# CATEGORIES OF BIBLICAL CORRESPONDENCE & CONCORDISM



## RE-CATEGORIZING THE ORIGINS DEBATE

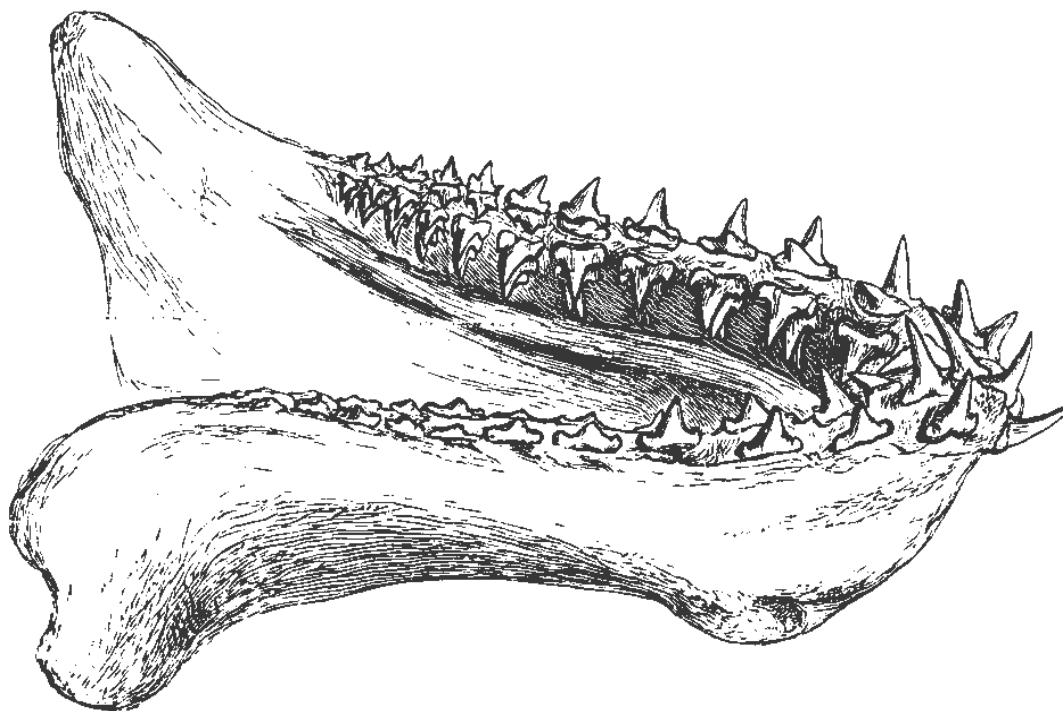


# SUMMARY:

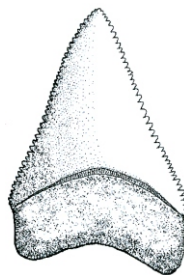
## HERMENEUTICS & THE ORIGINS DEBATE

	Cosmological Evolution	Geological Evolution	Biological Evolution	Concordism & Genesis 1
<b>Young Earth Creation</b> Gen 1 Days = 24 hrs Universe is 6000 yrs old	X	X	X	✓
<b>Progressive Creation</b> Gen 1 Days = millions of yrs Universe is 14 billion yrs old	✓	✓	X	✓
<b>Evolutionary Creation</b> Gen 1 has Ancient Science Universe is 14 billion yrs old	✓	✓	✓	X
<b>Deistic Evolution</b> Rejects the Bible Universe is 14 billion yrs old	✓	✓	✓	X
<b>Dysteleological Evolution</b> Rejects the Bible Universe is 14 billion yrs old	✓	✓	✓	X

# SHARK JAW & TEETH

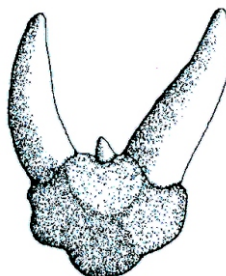


## PRINCIPLE OF SUPERPOSITION



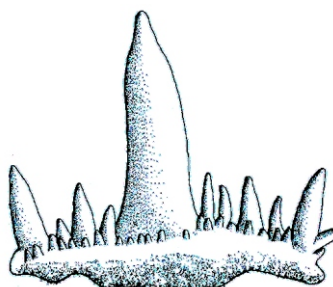
### Higher Layer of Strata

Laid down the latest  
(150 million yrs ago)



### Middle Layer of Strata

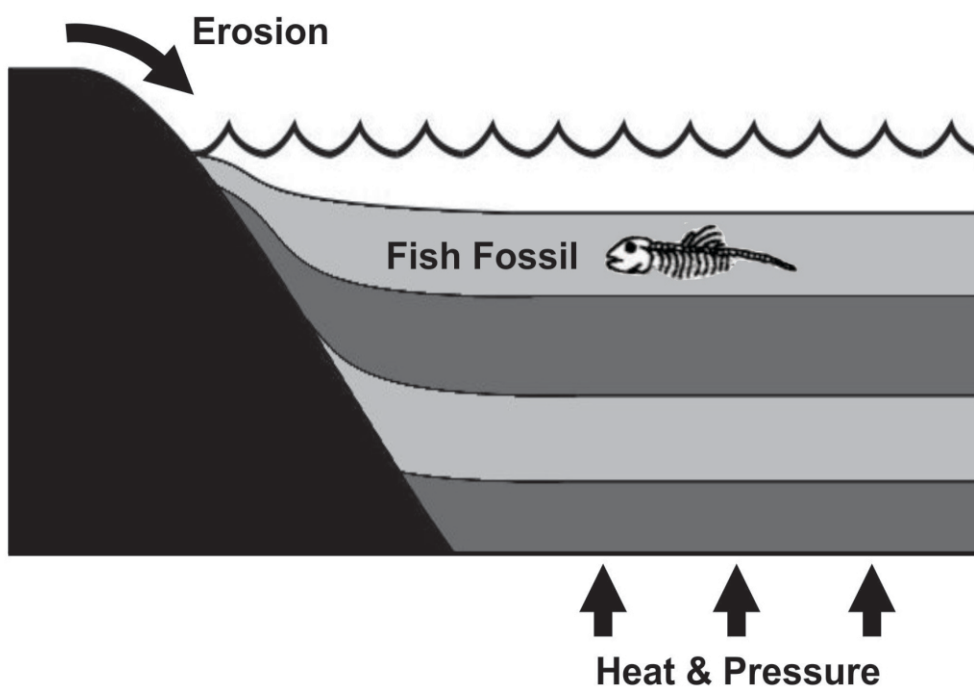
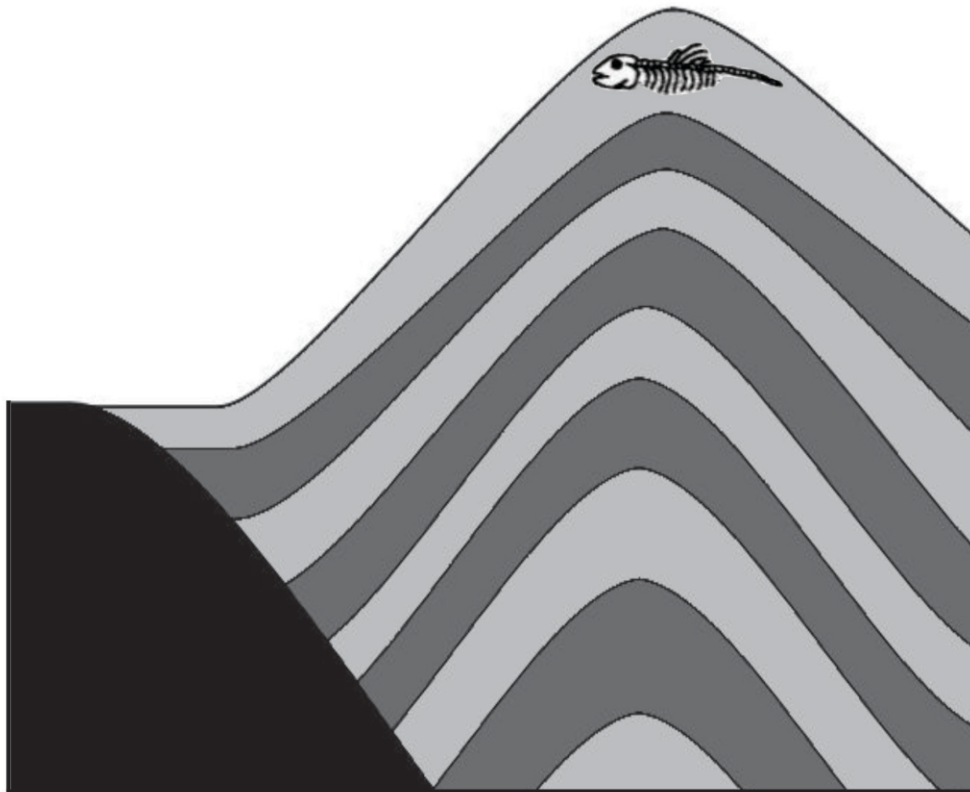
Laid down after the  
lower layer &  
before the higher layer  
(320 mya)



### Lower Layer of Strata

Laid down the earliest  
(400 mya)

# PRINCIPLE OF UNIFORMITARIANISM



# ANNUAL LAYERS DEPOSITED ON EARTH

## Varves at the Bottom of Lakes

Summer

Winter

Summer

Winter

Summer

Winter



## Snow Layers in Polar Ice Sheets

Summer

Winter

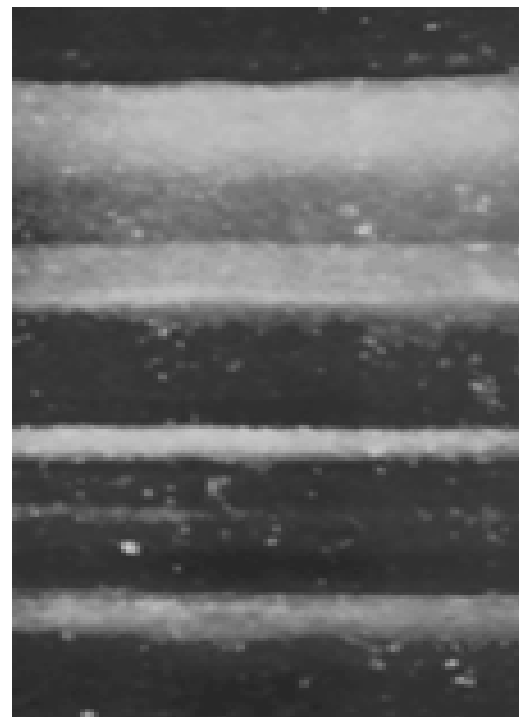
Summer

Winter

Summer

Winter

Summer

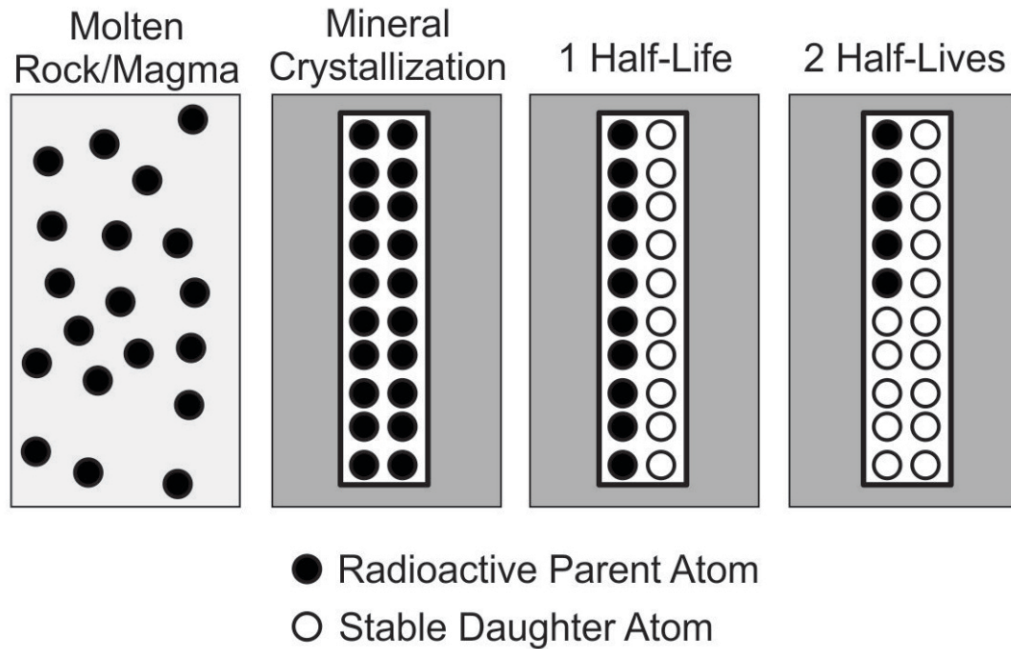


# THE GEOLOGICAL COLUMN

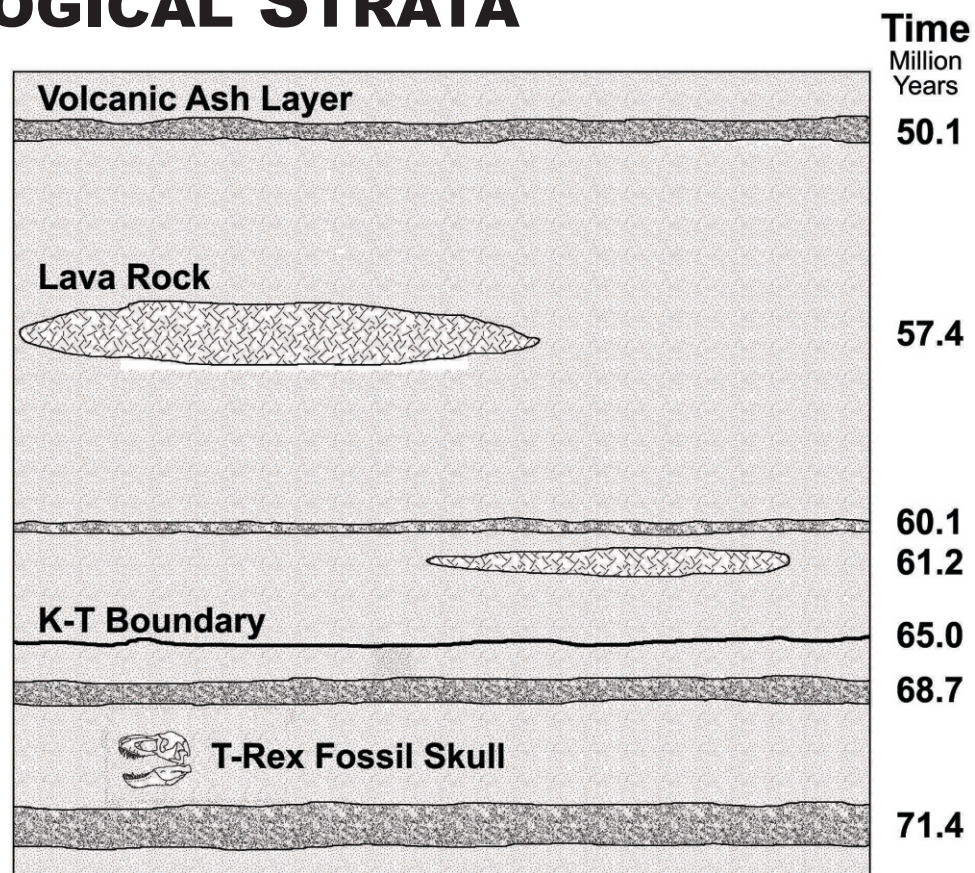
Era	Period	Age Million Yrs	1 <sup>st</sup> Fossil Evidence
<b>CENOZOIC</b>	<b>Quaternary</b>	2	Humans Archeological Artifacts Pre-Humans
	<b>Tertiary</b>		Whales Primates Extinction of Dinosaurs
<b>MESOZOIC</b>	<b>Cretaceous</b>	144	Flowering Plants Birds
	<b>Jurassic</b>	206	Mammals Dinosaurs
	<b>Triassic</b>	248	Mammal-Like Reptiles
<b>PALEOZOIC</b>	<b>Permian</b>	290	Reptiles
	<b>Carboniferous</b>	354	Seed Bearing Plants Amphibians
	<b>Devonian</b>	417	Jawed Fishes
	<b>Silurian</b>	443	Land Plants
	<b>Ordovician</b>	490	Jawless Fishes
	<b>Cambrian</b>	540	Marine Animals with Skeletons
<b>PRECAMBRIAN</b>	<b>Proterozoic</b>	2500	Soft-Bodied Marine Animals Marine Plants
			Multi-Cell Organisms
	<b>Archean</b>	4500	One-Cell Organisms Origin of Earth



# RADIOACTIVE DECAY & HALF-LIVES

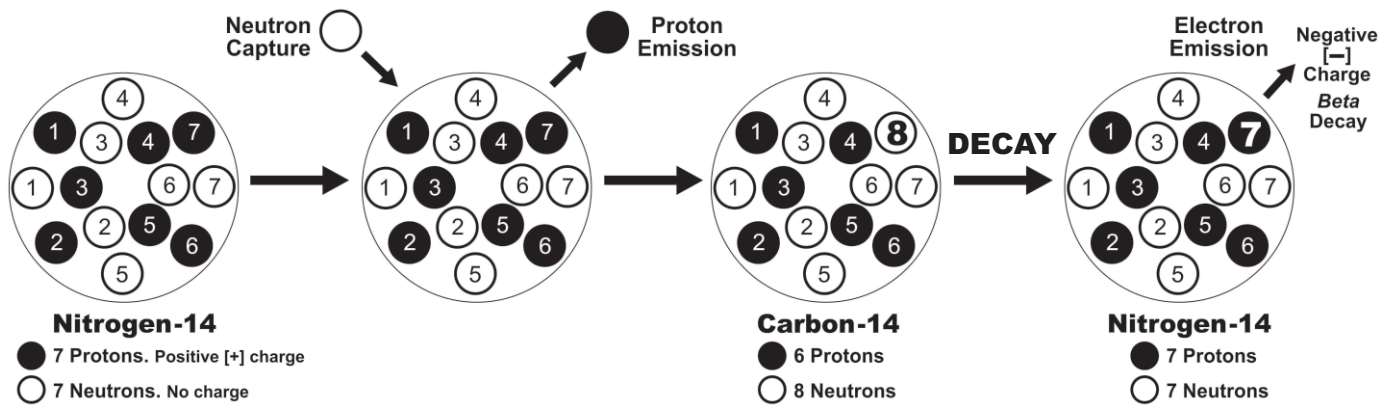


## RADIOMETRIC DATING & GEOLOGICAL STRATA

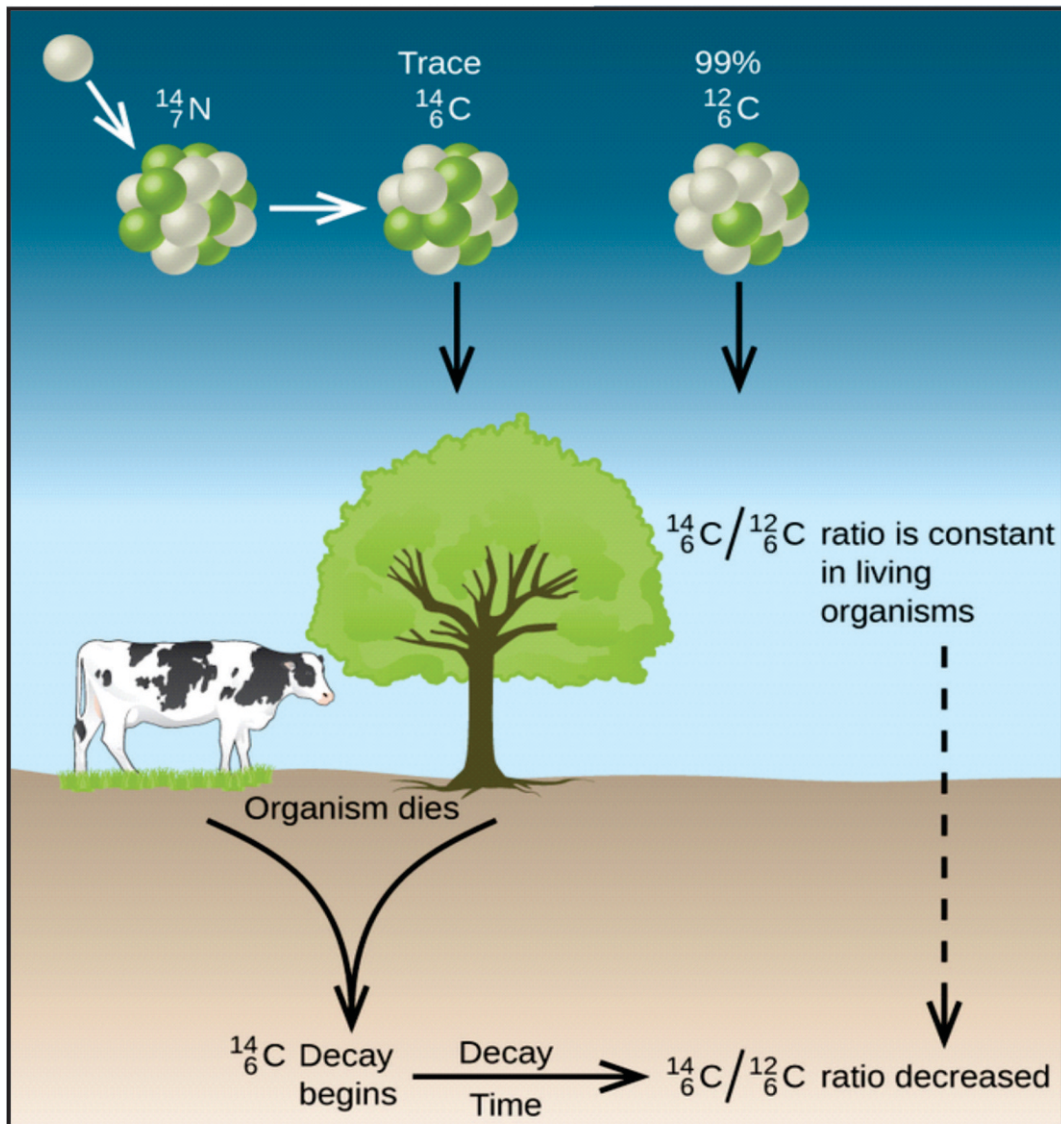


# CARBON-14 RADIOMETRIC DATING

## Production & Decay of Carbon-14

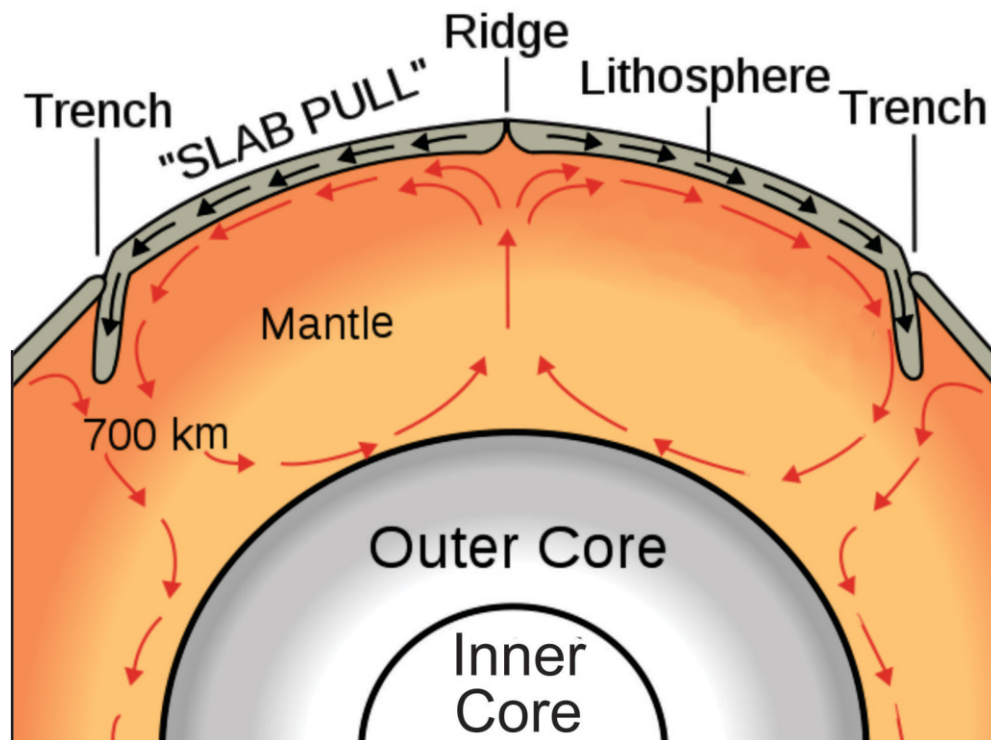


## The Carbon Cycle





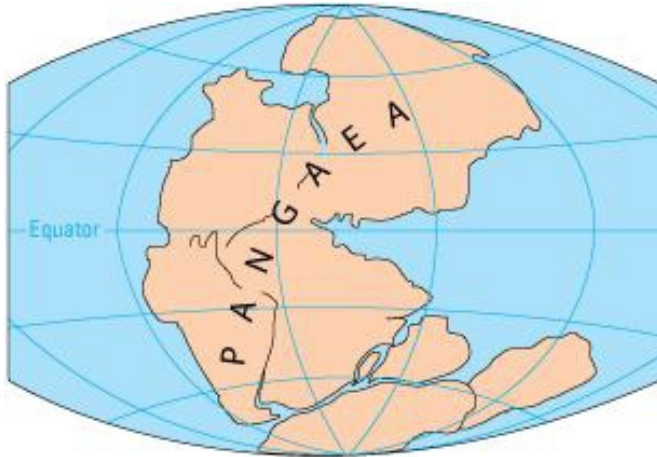
# STRUCTURE OF THE EARTH



## TECTONIC (CONTINENTAL) PLATES



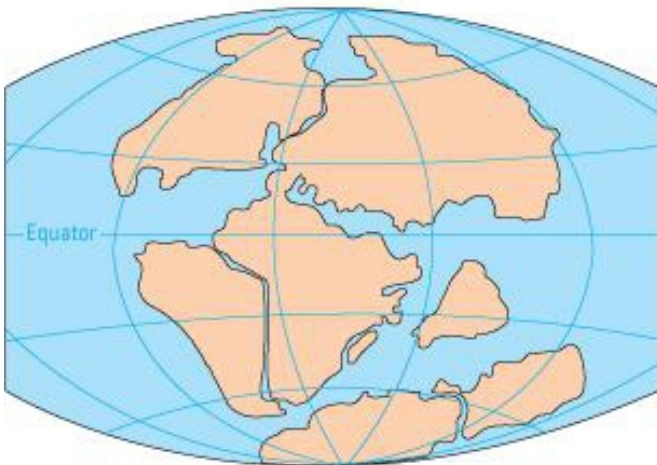
# THE BREAKUP OF PANGEA INTO MODERN CONTINENTS



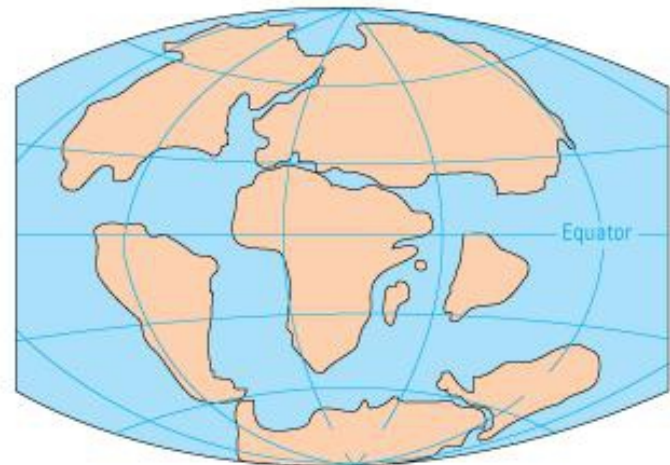
PERMIAN  
225 million years ago



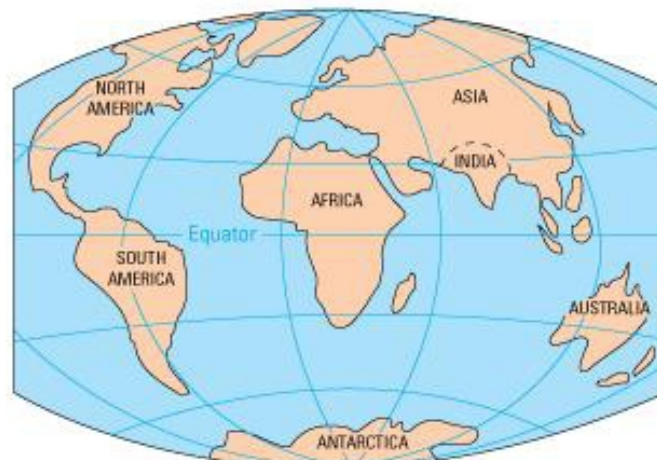
TRIASSIC  
200 million years ago



JURASSIC  
150 million years ago



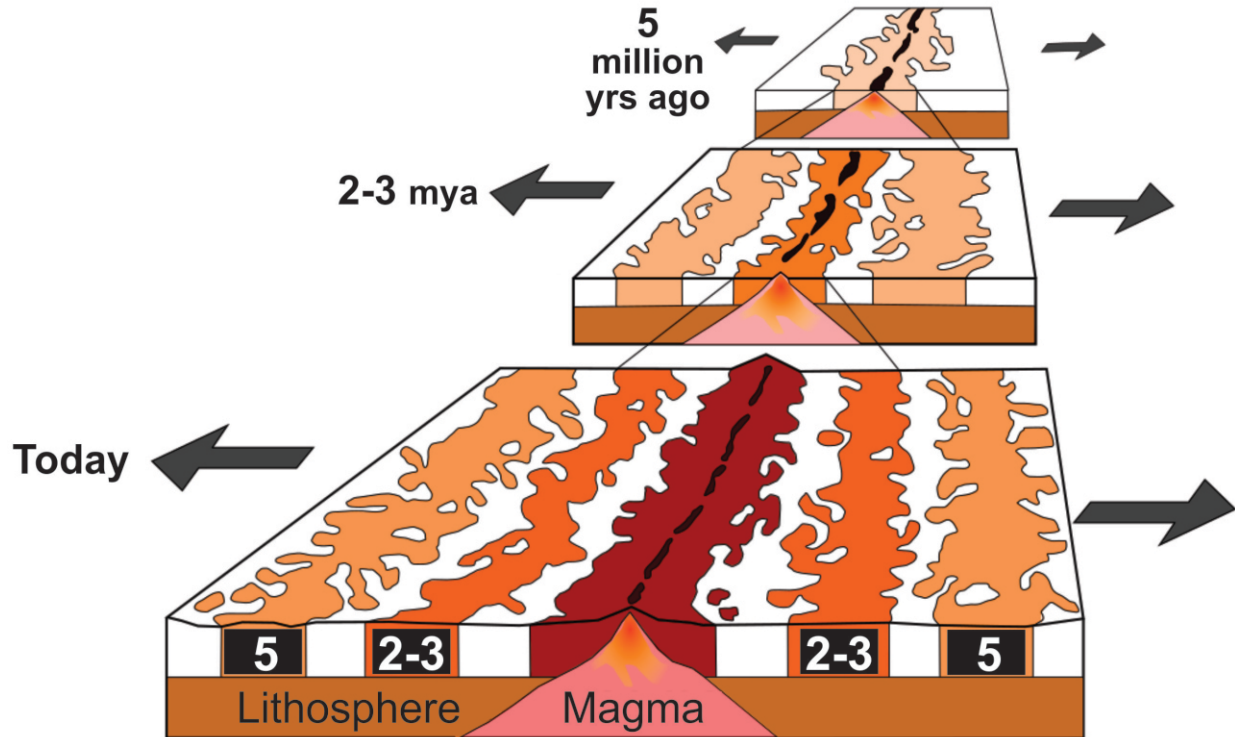
CRETACEOUS  
65 million years ago



PRESENT DAY



# SPREADING OF OCEAN FLOOR



## MID-ATLANTIC RIDGE

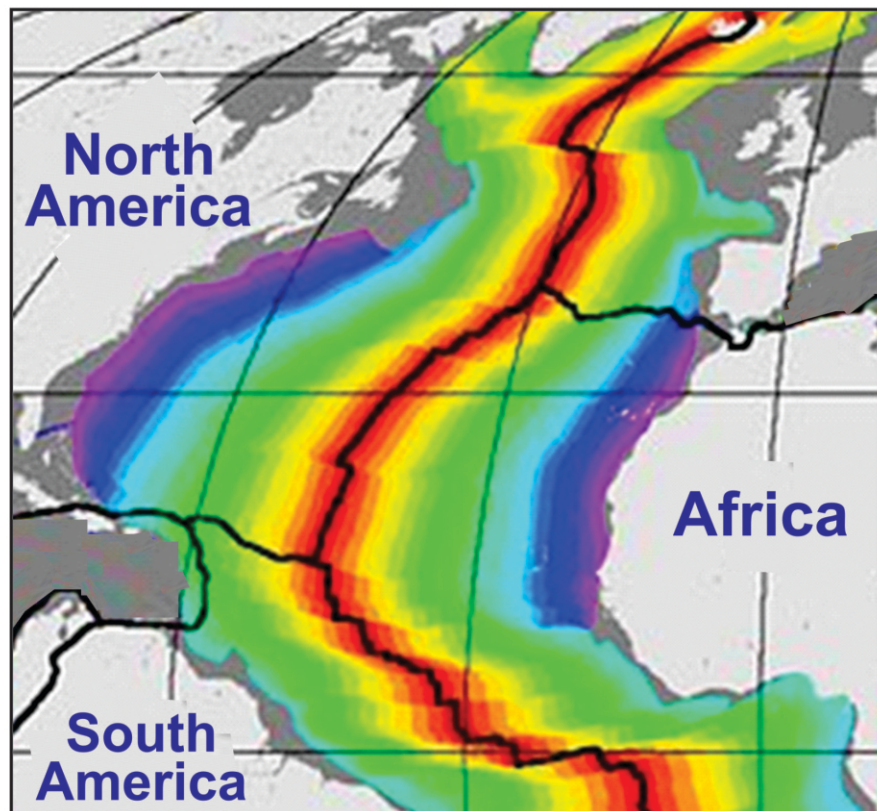
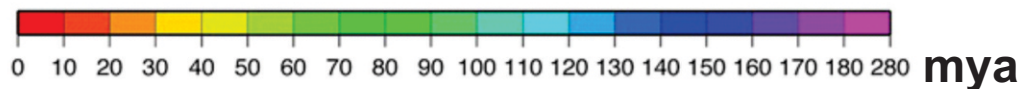
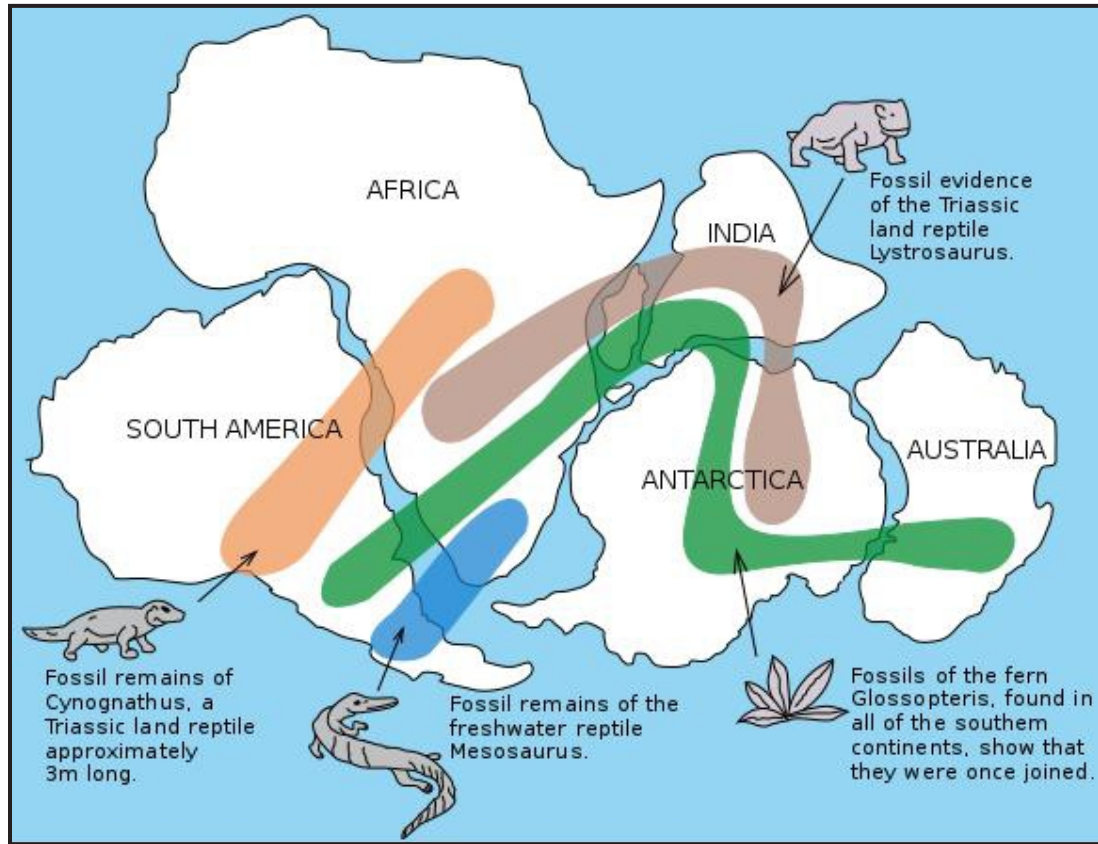


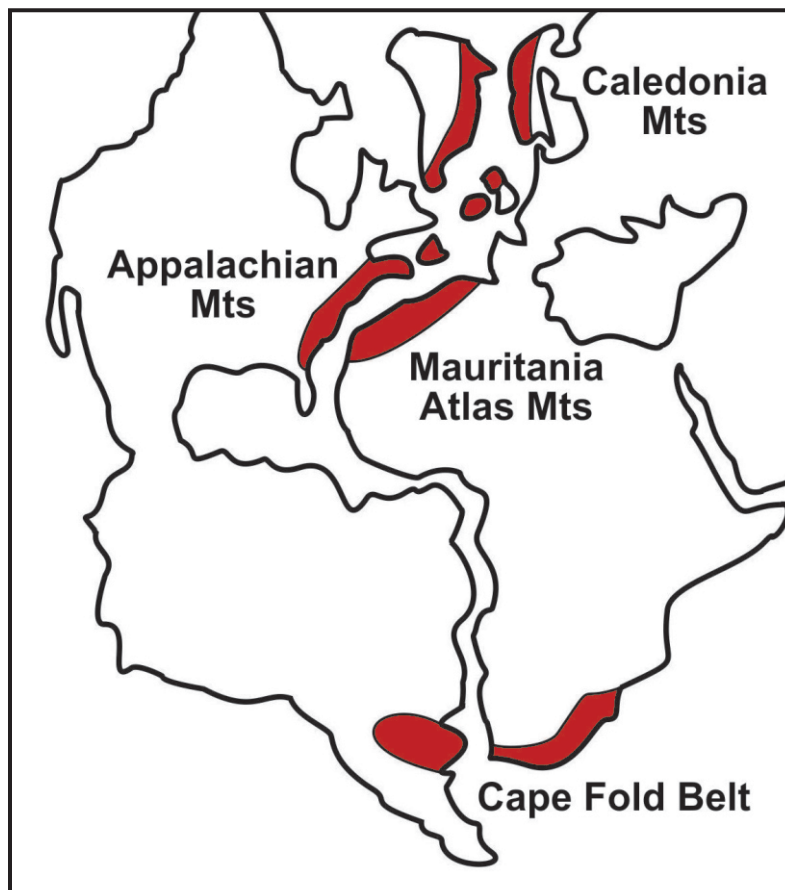
Image  
Credits  
p. 92-93



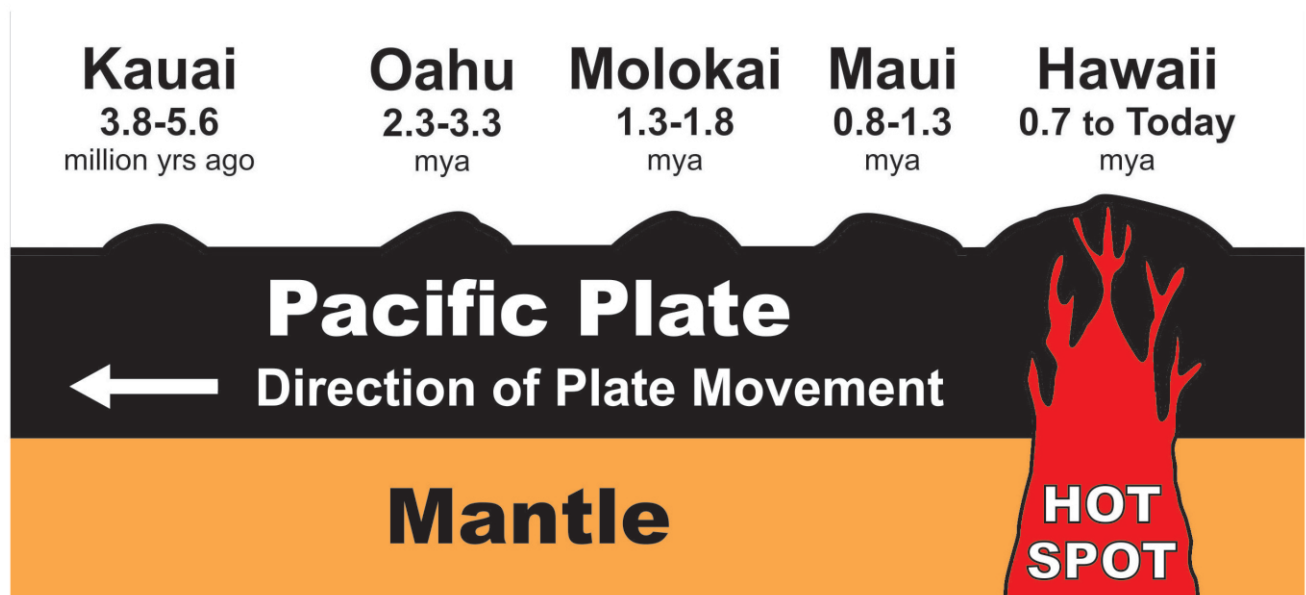
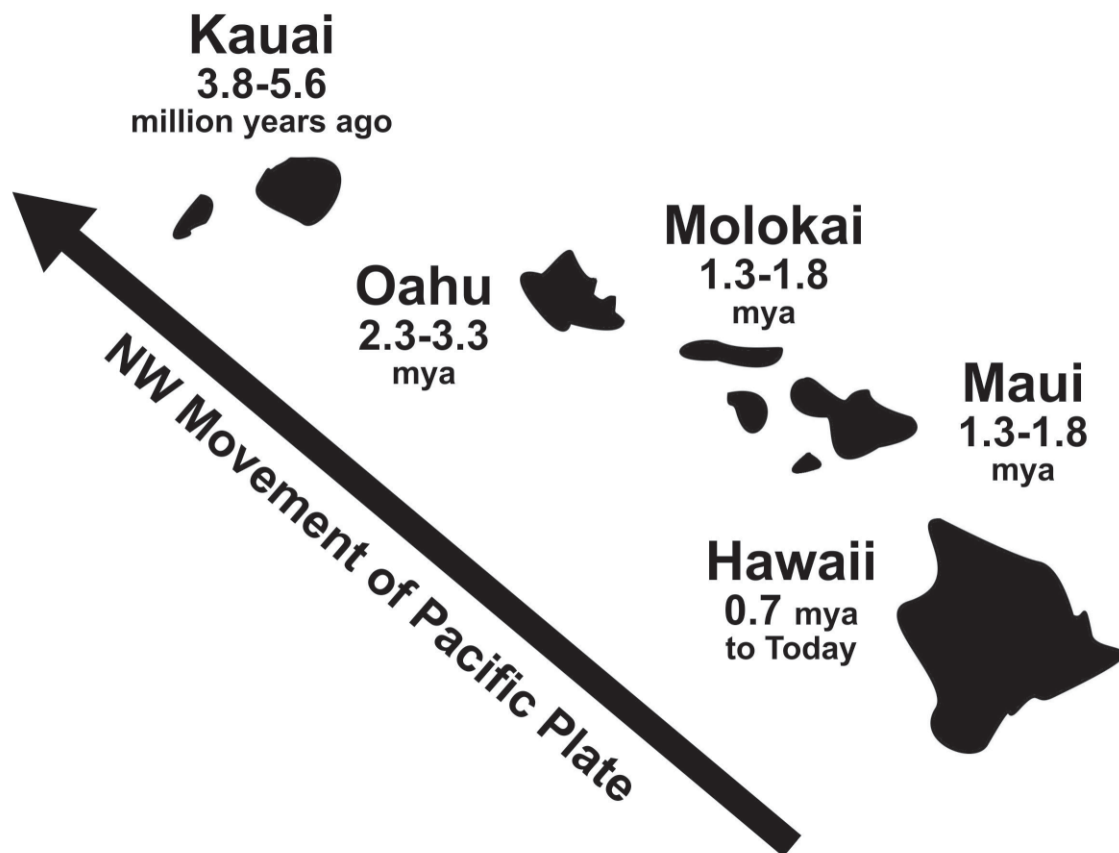
# PANGEA: SIMILAR PLANTS & ANIMALS



## PANGEA: BREAKUP OF MOUNTAIN RANGES

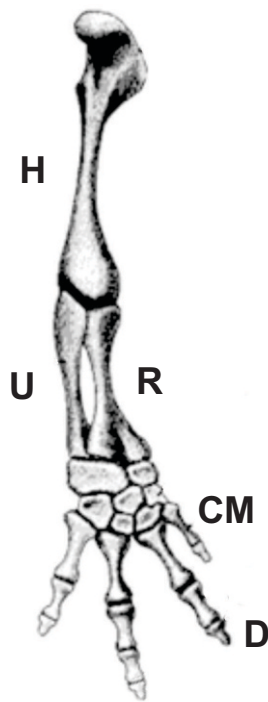


# HAWAIIAN ISLANDS, PLATE TECTONICS & RADIO-METRIC DATING

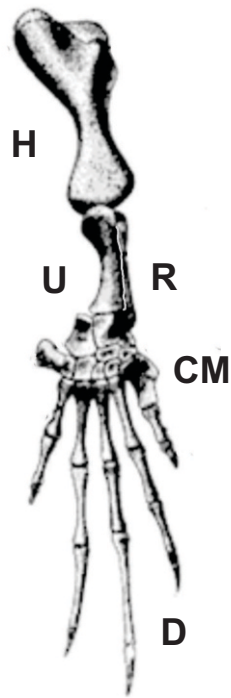


# HOMOLOGY OF BONES

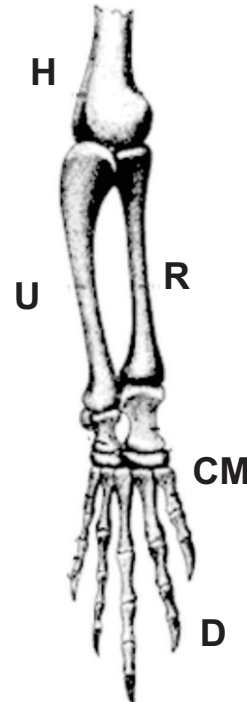
## Anterior Limb: Leg/Wing/Fin/Arm



**Salamander**  
Amphibian



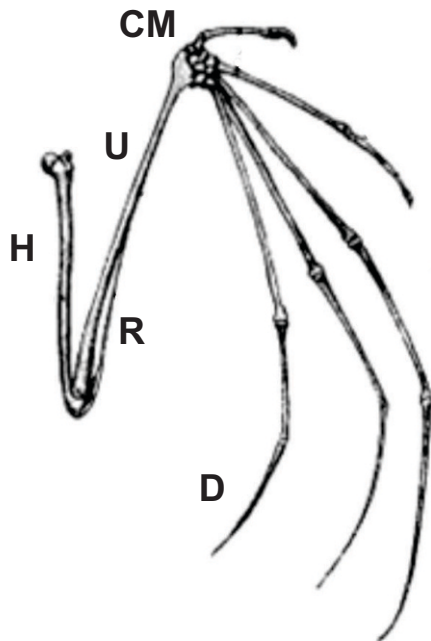
**Tortoise**  
Reptile



**Crocodile**  
Reptile



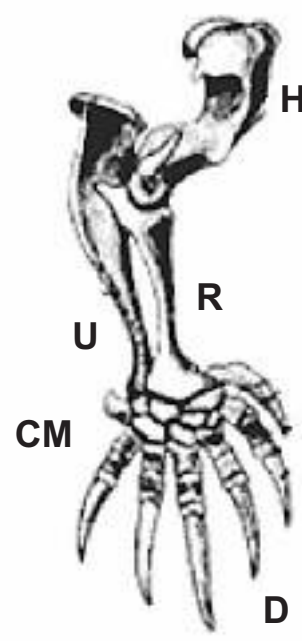
**Chicken**  
Bird



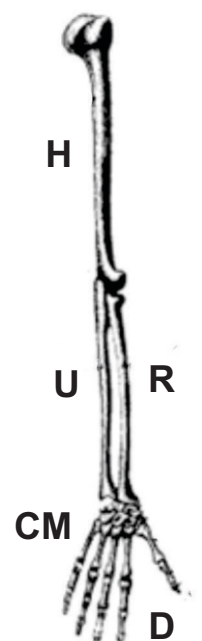
**Bat**  
Mammal



**Whale**  
Mammal



**Mole**  
Mammal

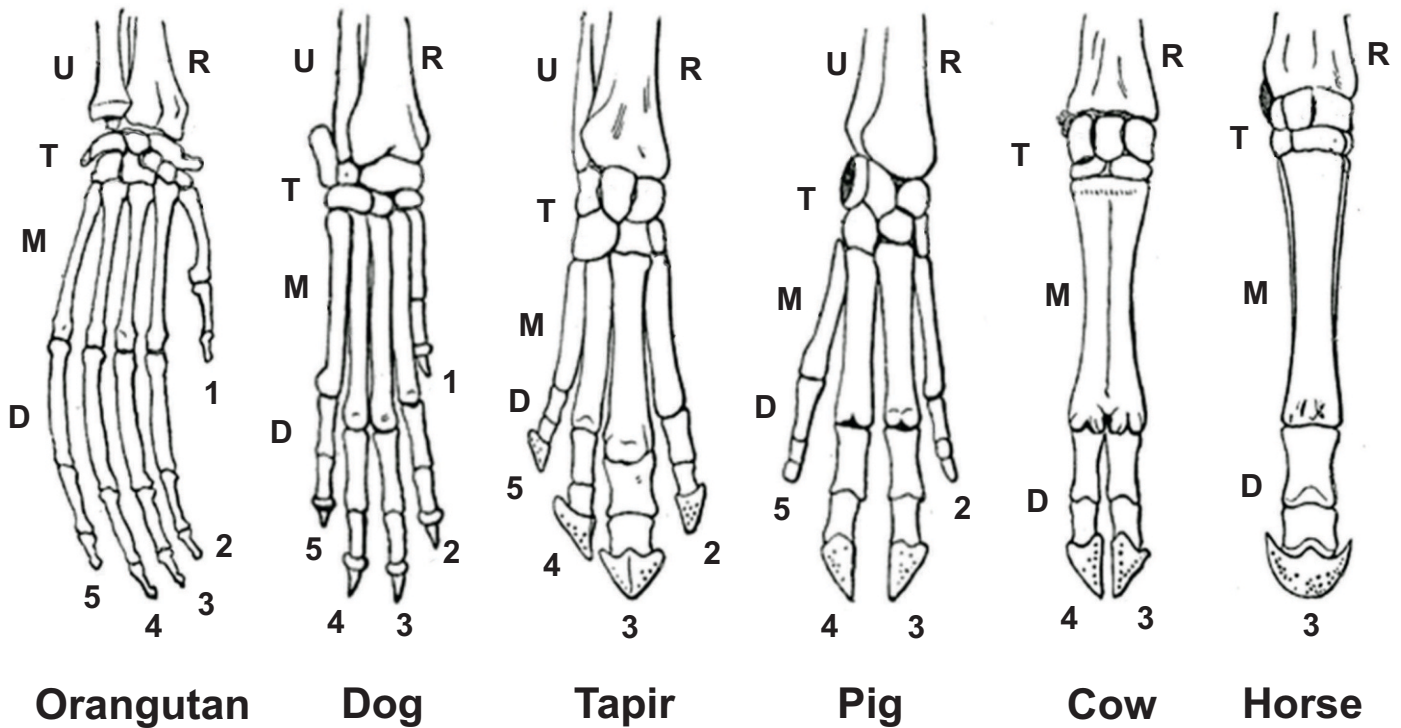


**Human**  
Mammal

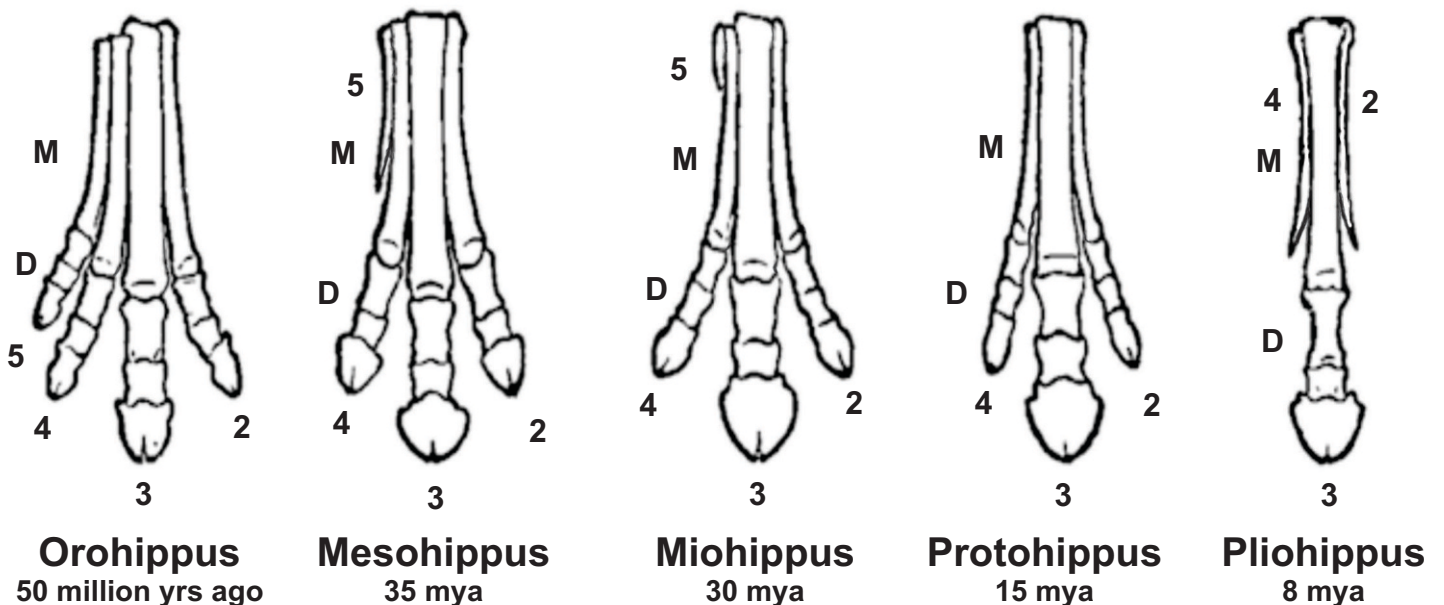


# HOMOLOGY OF BONES

## Anterior Limb: Hands/Feet

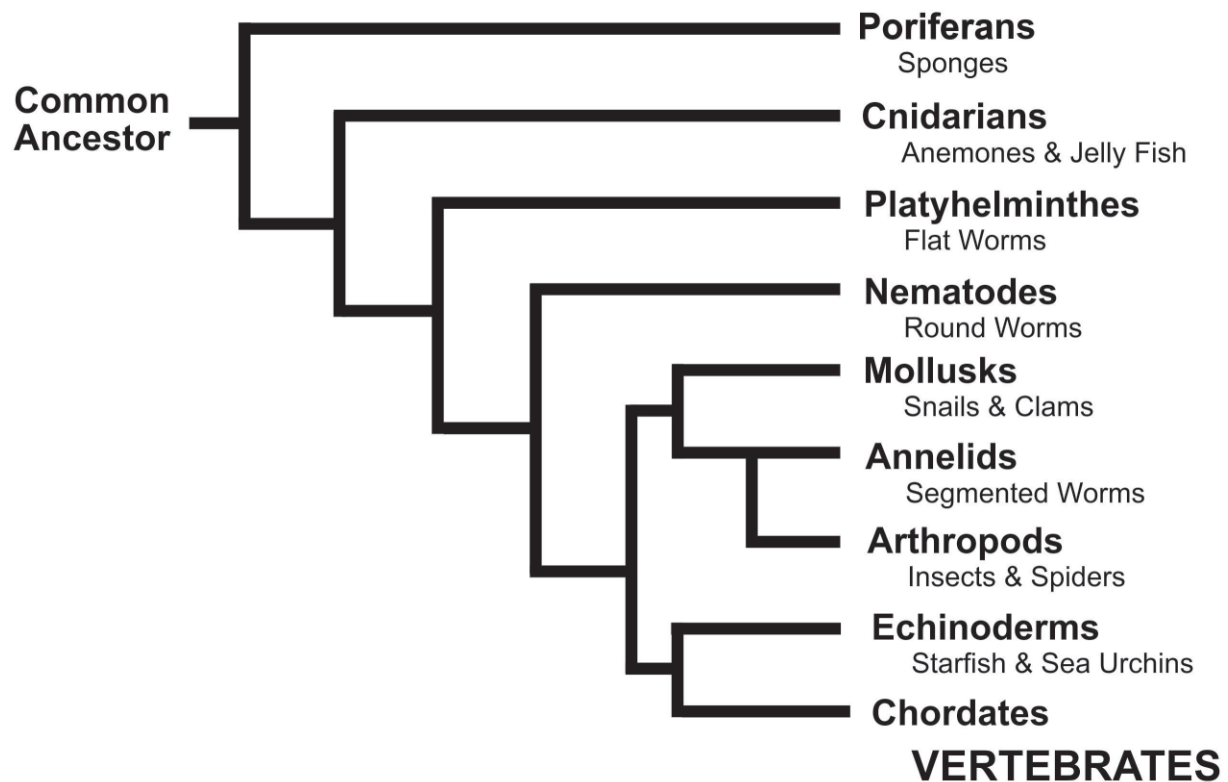


## Evolution of the Foot (Anterior) of the Horse

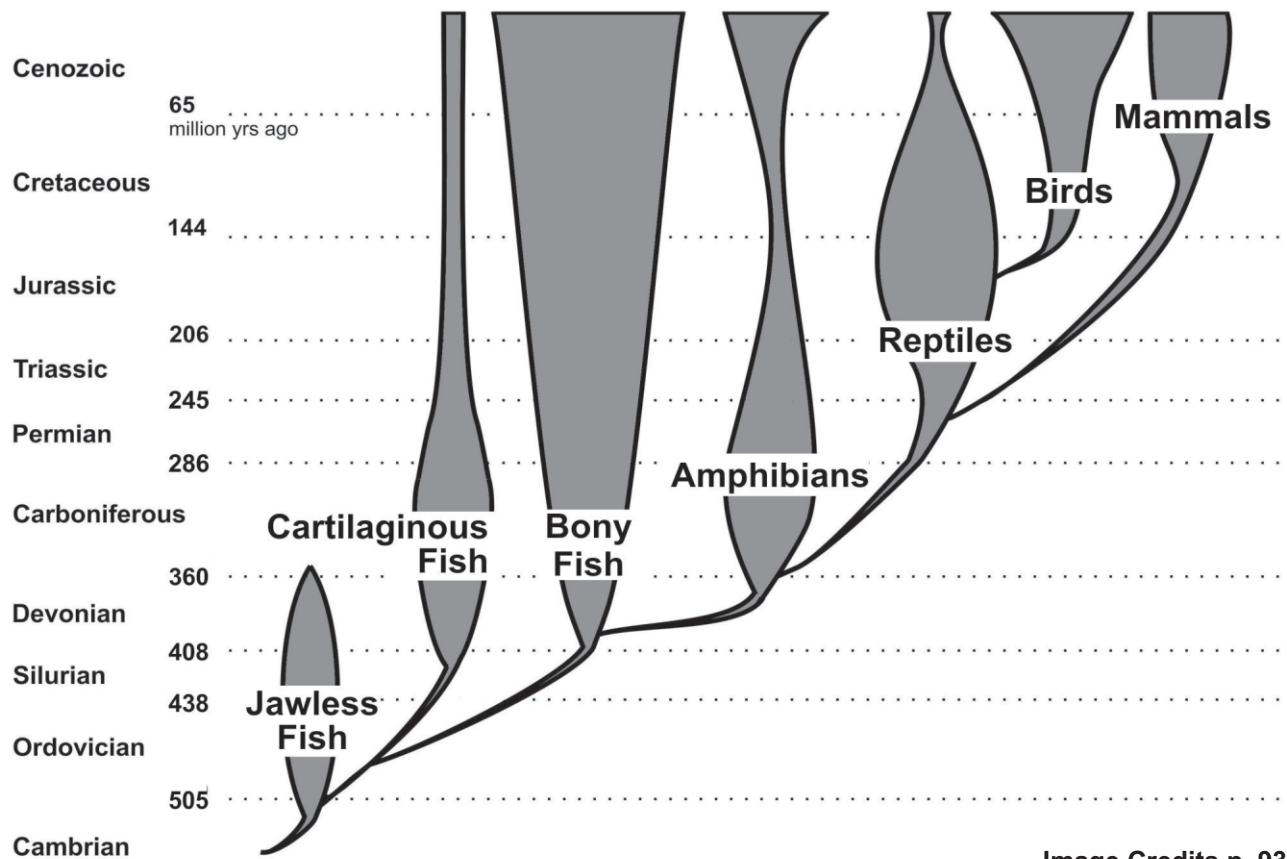


H: humerus    R: radius    U: ulna  
T: Tarsals (ankle bones)    M: Metatarsal (foot bones)    D: digits

# EVOLUTION OF ANIMALS



# EVOLUTION OF VERTEBRATES





# FISH-TO-AMPHIBIAN EVOLUTION

**Eusthenopteron**  
Lobe-Finned Fish  
385 mya



**Panderichthys**  
Lobe-Finned Fish  
380 mya



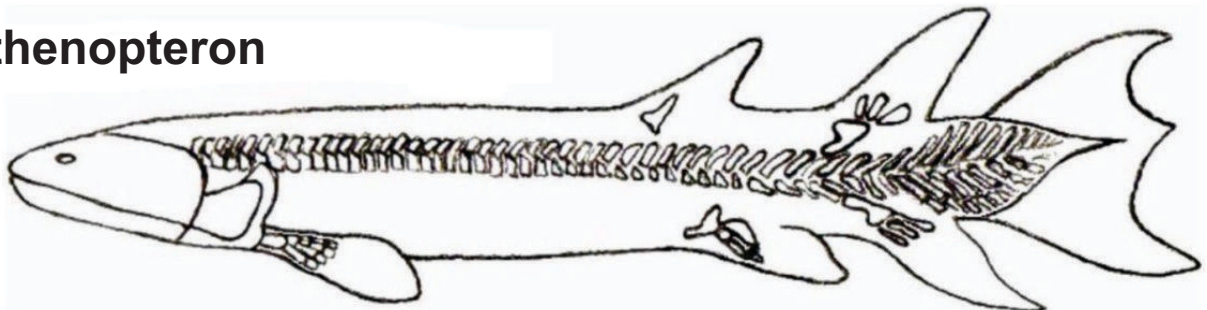
**Tiktaalik** “Fish-apod”  
Lobe-Finned Fish  
could crawl on land  
375 mya



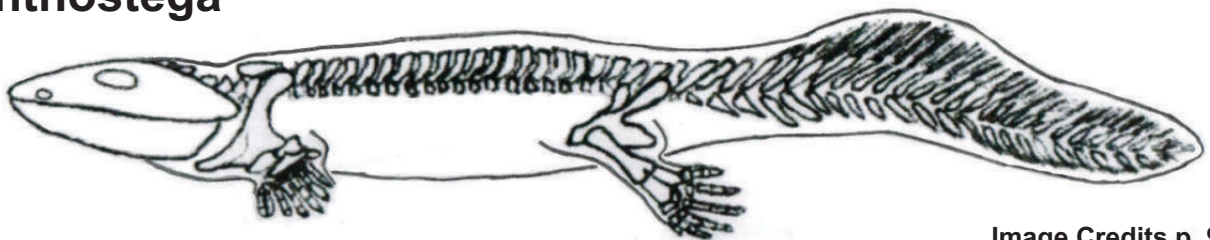
**Acanthostega**  
Early Amphibian  
365 mya



**Eusthenopteron**

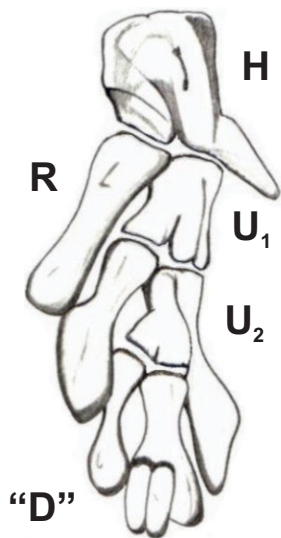


**Acanthostega**

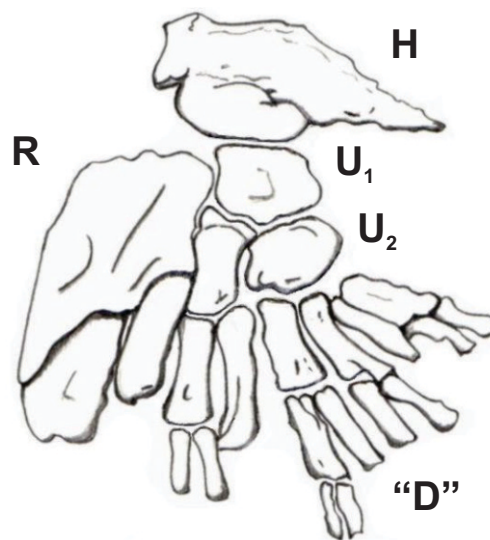


# FISH-TO-AMPHIBIAN EVOLUTION

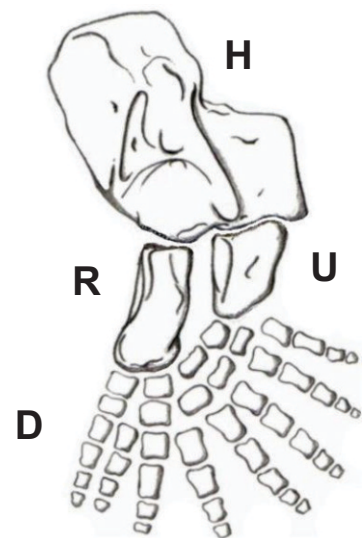
## FIN-TO-LIMB EVOLUTION



**Eusthenopteron**  
Lobe-Finned Fish  
385 mya



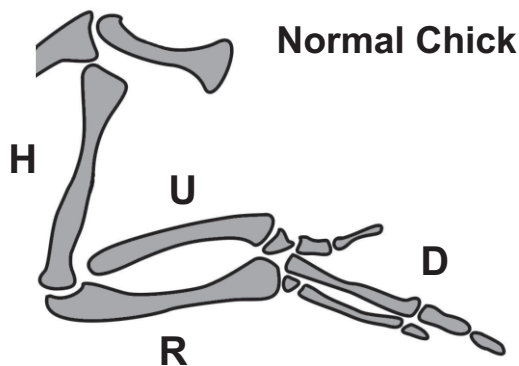
**Sauripterus**  
"Fish with Fingers"  
375 mya



**Acanthostega**  
Early Amphibian  
365 mya

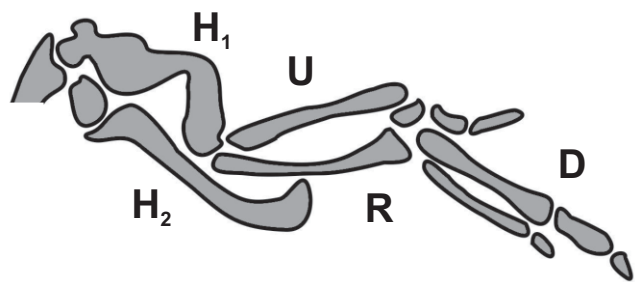
H: humerus R: radius U: ulna D: digits "D": digit-like bones

## Experimental Limbs & Changes in Bone Anatomy



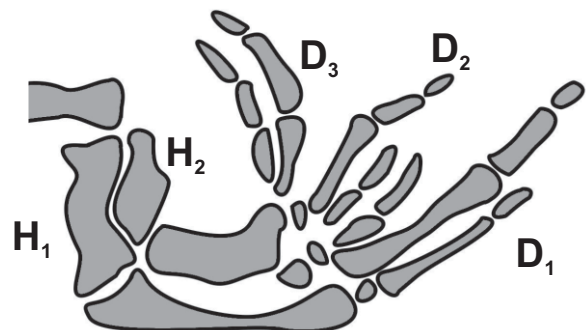
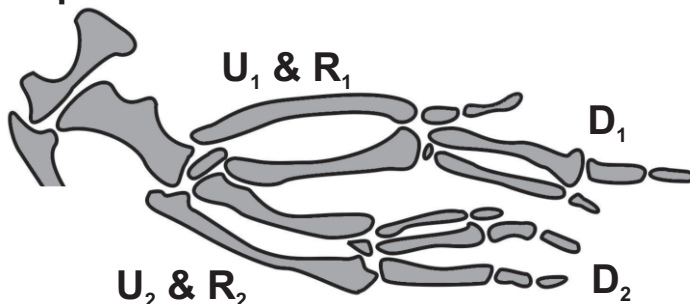
Normal Chick

Experimental Chick



Experimental Chick

Experimental Chick



# REPTILE-TO-MAMMAL EVOLUTION

## Protorothyris

Reptile  
305 mya



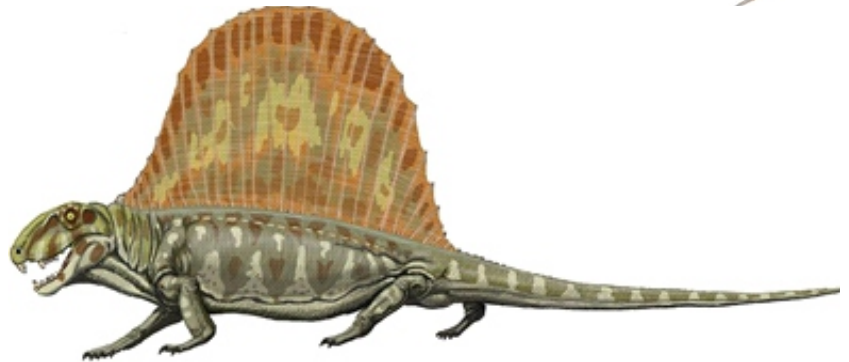
## Haptodus

Mammal-like Reptile  
300 mya



## Dimetrodon

Mammal-like Reptile  
285 mya



## Thrinaxodon

Mammal-like Reptile  
250 mya



## Probainognathus

Mammal-like Reptile  
225 mya



## Morganucodon

Early Mammal  
205 mya



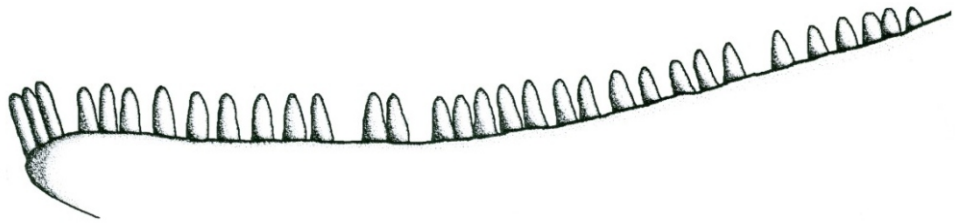


# REPTILE-TO-MAMMAL EVOLUTION

## TOOTH EVOLUTION

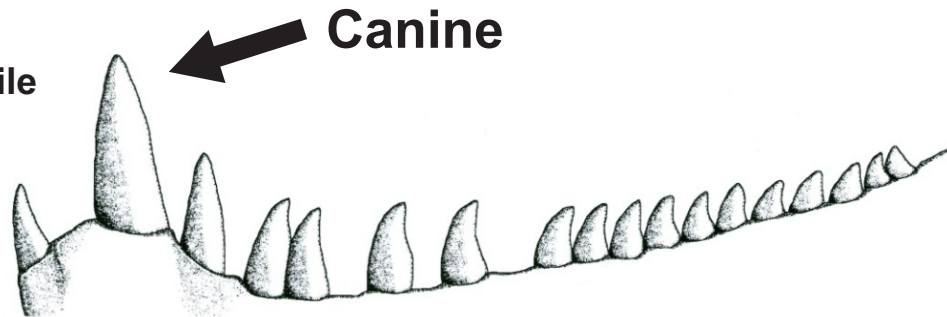
### Protorothyris

Reptile  
305 mya



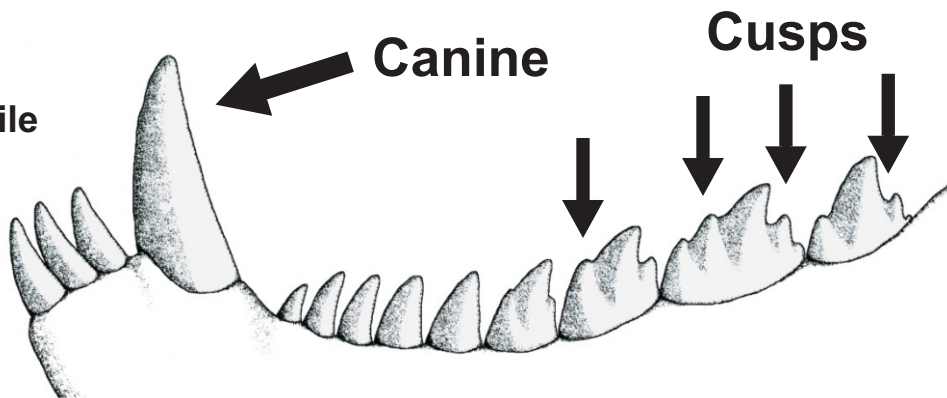
### Dimetrodon

Mammal-like Reptile  
285 mya



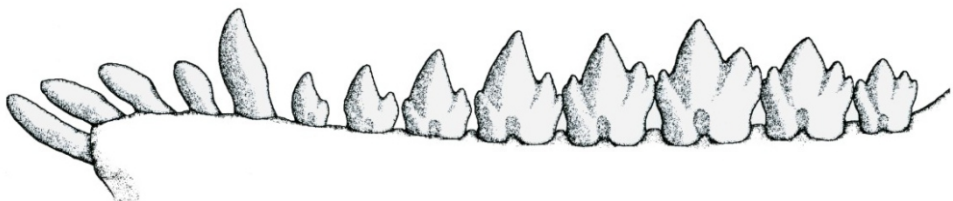
### Cynognathus

Mammal-like Reptile  
250 mya



### Morganucodon

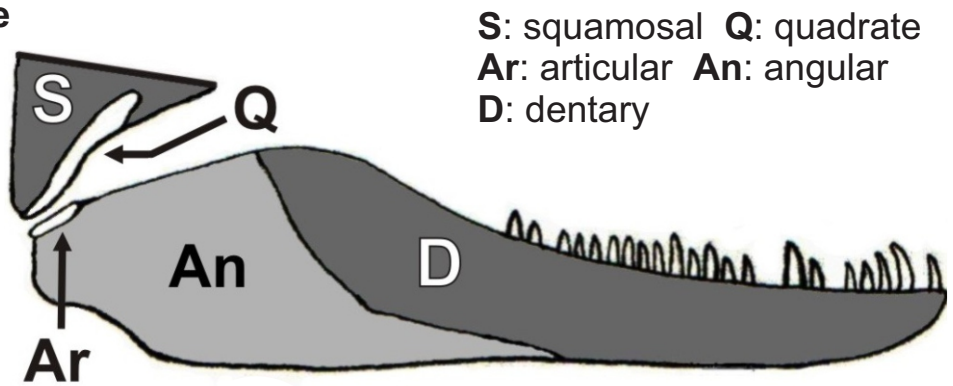
Early Mammal  
205 mya



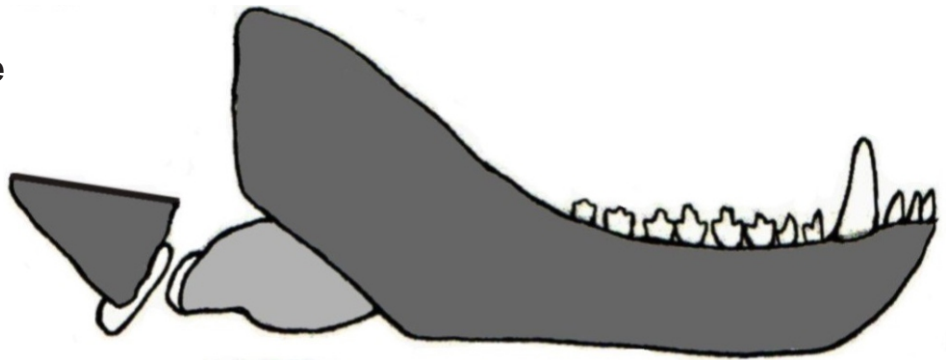
# REPTILE-TO-MAMMAL EVOLUTION

## JAW JOINT EVOLUTION

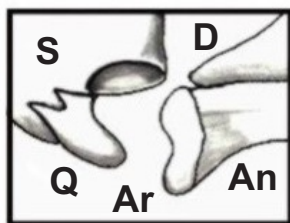
**Haptodus**  
Mammal-like Reptile  
300 mya



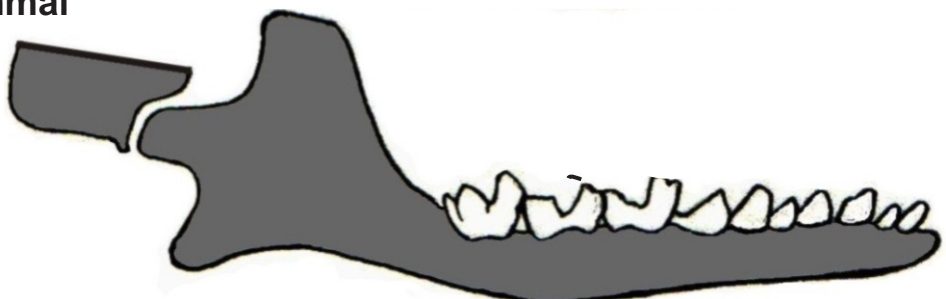
**Thrinaxodon**  
Mammal-like Reptile  
250 mya



**Probainognathus**  
Mammal-like Reptile  
225 mya



**Daulestes**  
Early Placental Mammal  
95 mya



# REPTILE-TO-BIRD EVOLUTION

## Sinosauropteryx

Dinosaur with  
Filaments  
125 mya



## Caudipteryx

Dinosaur with  
Feathers on Tips  
of Tail & Arms  
120 mya



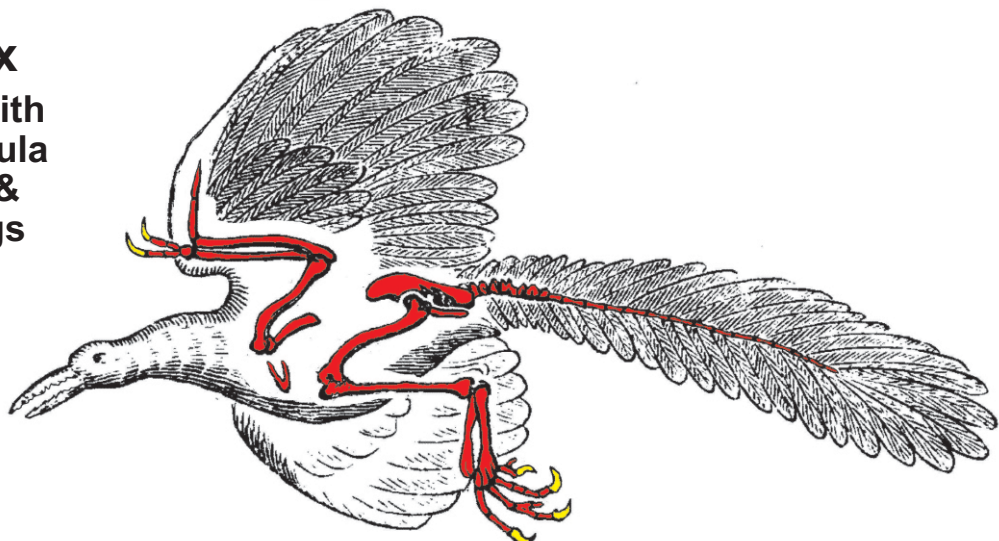
## Microraptor

Dinosaur with  
Feathers on Arms,  
Legs & Tail  
120 mya



## Archeopteryx

Ancient Bird with  
Wishbone, Fibula  
on Lower Leg &  
Claws on Wings  
150-125 mya



# REPTILE-TO-BIRD EVOLUTION

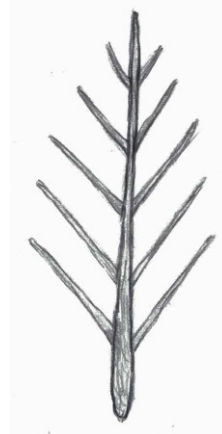
## Evolution of Feathers in Dinosaurs



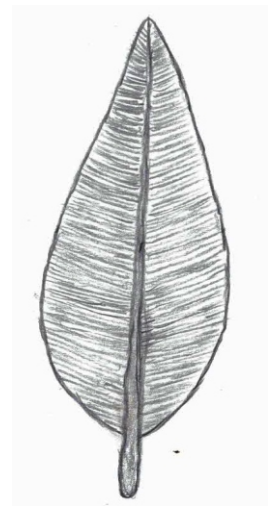
**Single Filament**  
Sinosauropteryx  
125 mya



**Distally Branched Filament**  
Sinornithosaurus  
122 mya

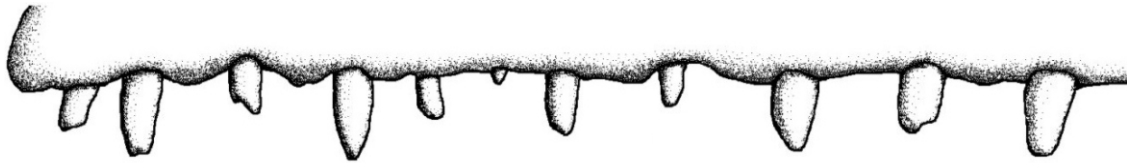


**Laterally Branched Filament**  
Body of Caudipteryx  
120 mya

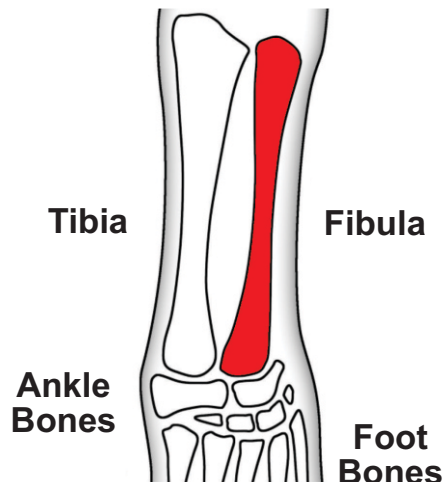


**Early Feather**  
Tips of Wings & Tail  
of Caudipteryx  
120 mya

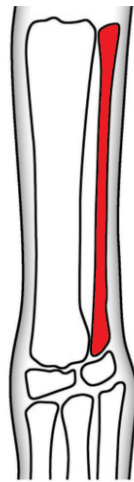
## Upper Jaw & Teeth of Archeopteryx



## Lower Limb of Archeopteryx, Reptiles & Modern Birds



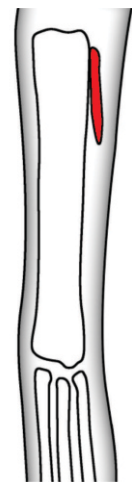
**Ancient & Modern Reptiles**



**Ancient Bird Archaeopteryx**



**Modern Bird Adult**



**Modern Bird Chick**



# LAND ANIMAL-TO-WHALE EVOLUTION

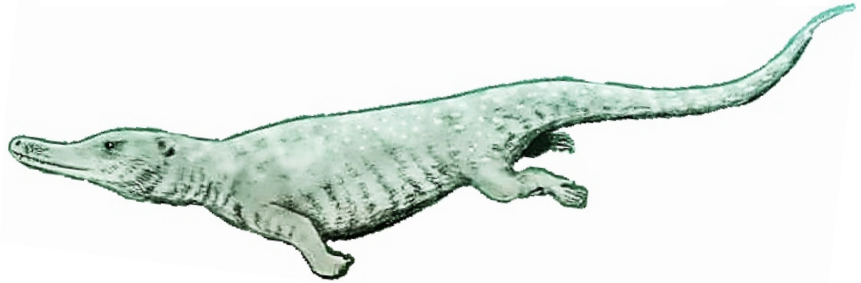
## Ambulocetus

Walking Whale  
49 million years ago



## Remingtonocetus

Semi-Aquatic Whale  
48 mya



## Rodhocetus

Semi-Aquatic Whale  
45 mya



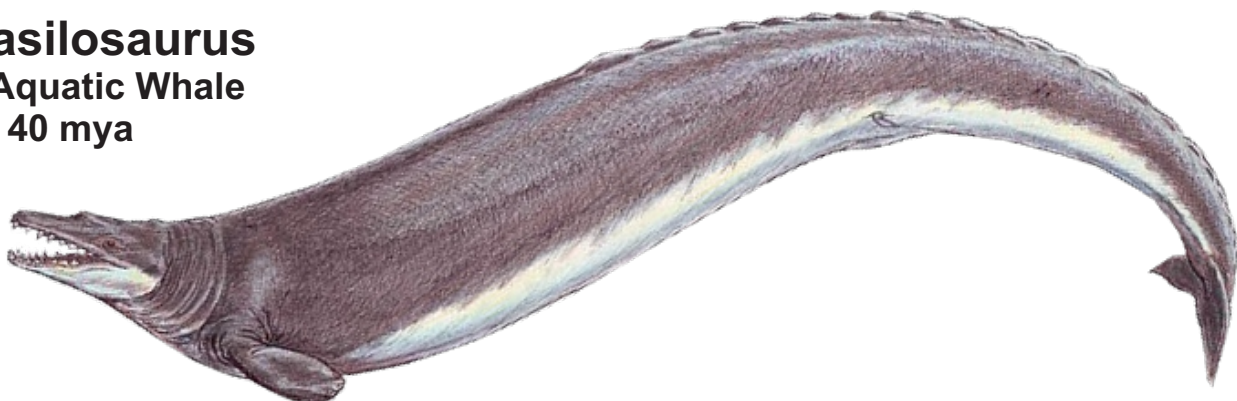
## Dorudon

Aquatic Whale  
40 mya



## Basilosaurus

Aquatic Whale  
40 mya



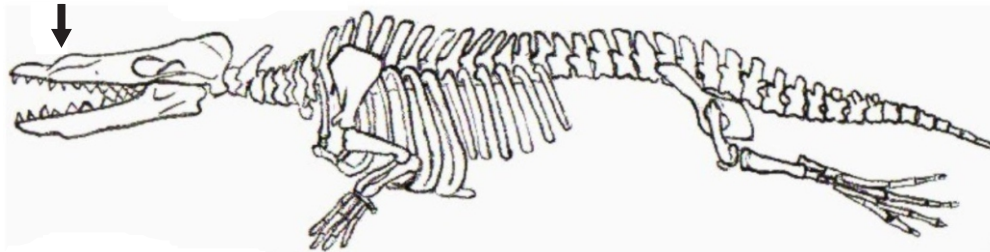


# LAND ANIMAL-TO-WHALE EVOLUTION

**Ambulocetus** Walking Whale 49 million years ago



**Rodhocetus** Semi-Aquatic Whale 45 mya

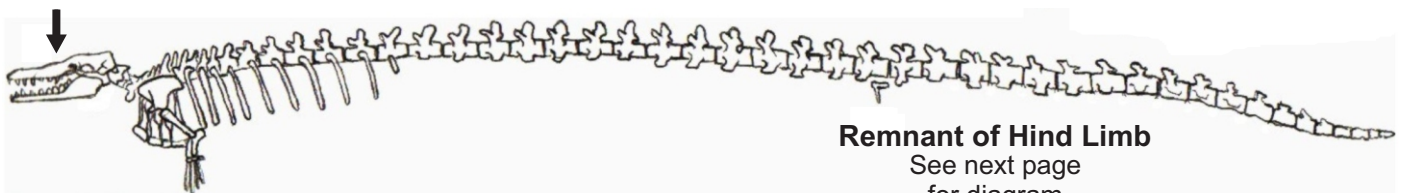


**Dorudon** Aquatic Whale 40 mya



Remnant of Hind Limb

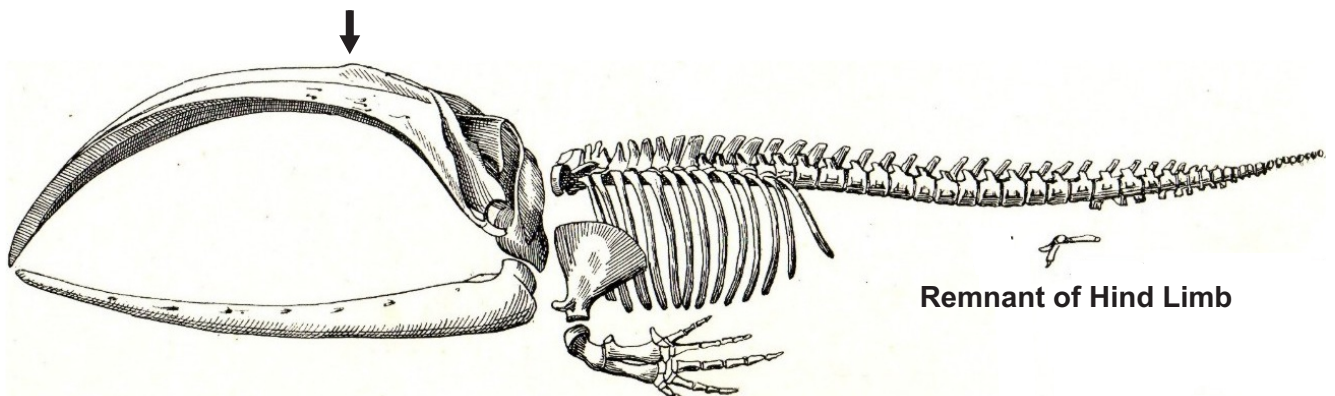
**Basilosaurus** Aquatic Whale 40 mya



Remnant of Hind Limb

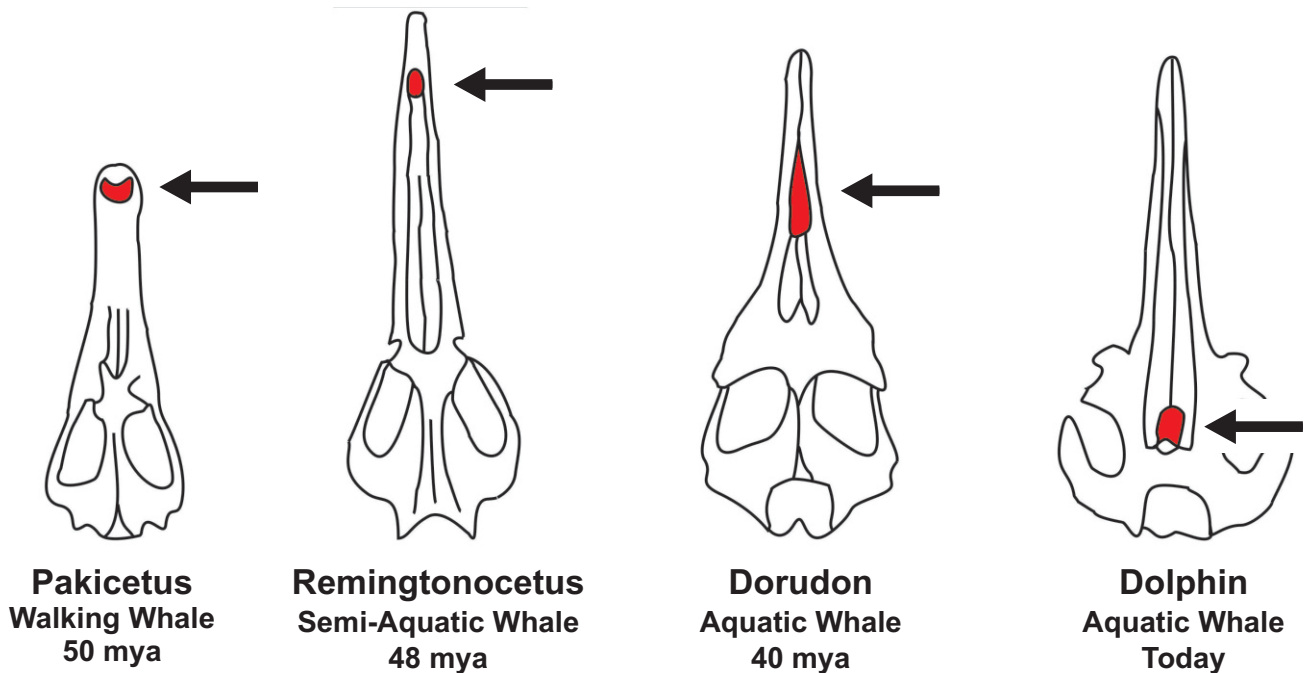
See next page  
for diagram

**Bowhead Whale** Modern Baleen Whale



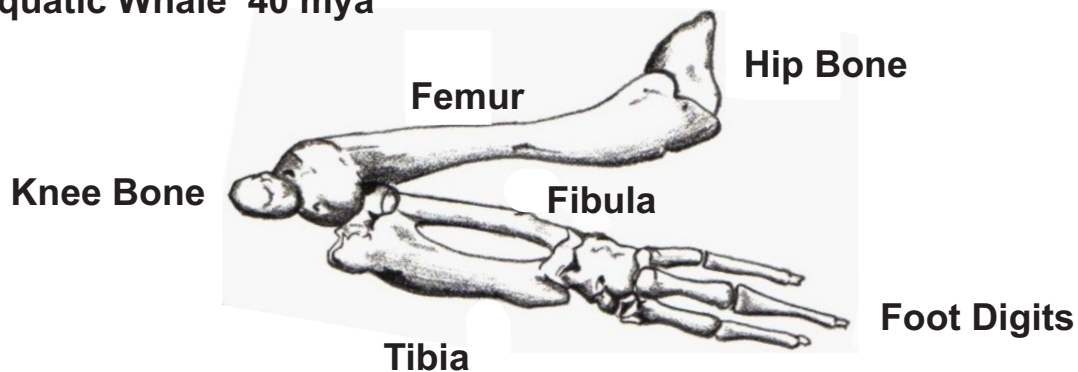
# LAND ANIMAL-TO-WHALE EVOLUTION

## Evolution of the Nasal Cavity/Blowhole

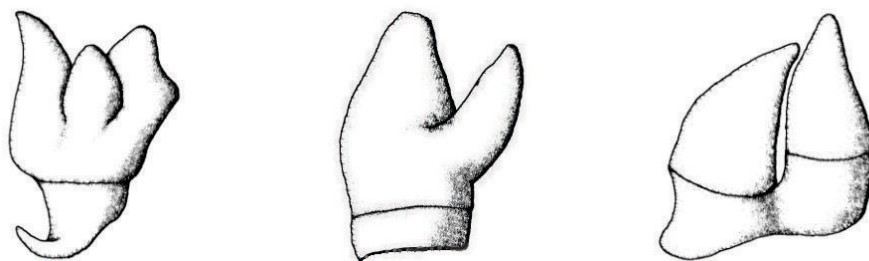


## Remnant Hind Limb of Basilosaurus

Aquatic Whale 40 mya



## Fetal Teeth of Modern Baleen Whales

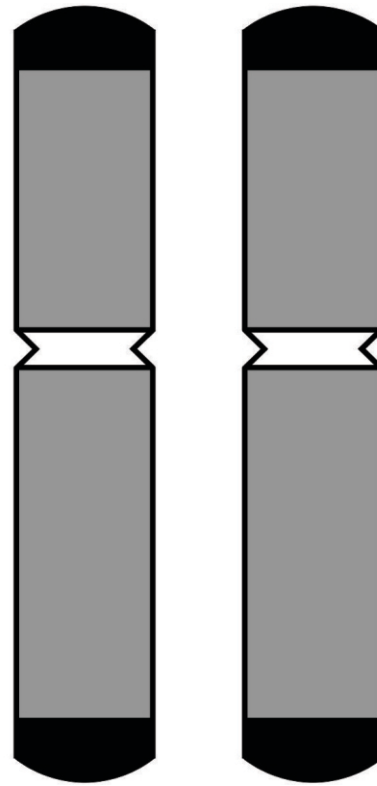


# BRIEF REVIEW OF GENETICS

## Structure of Chromosomes

### Humans:

- 23 Pairs of Chromosomes  
Total: 46 Chrom.
- 20,000 Genes
- 2 Yards of DNA Per Cell  
Wrapped tightly together to form chromosomes



### Telomere

Caps of DNA that protect chromosomes

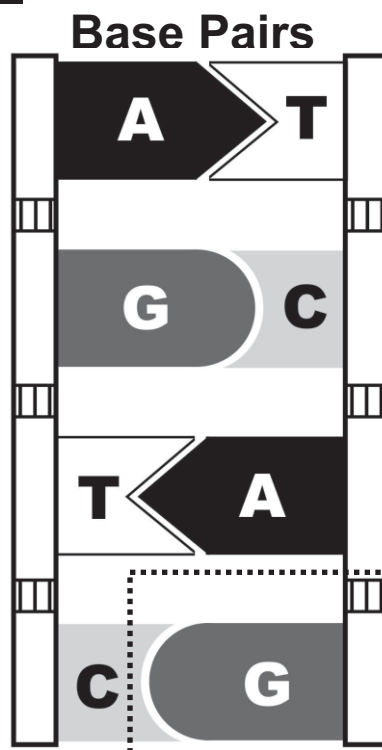
### Centromere

Involved in cell division

## Structure of DNA

### Humans:

- 3.2 Billion Base Pairs  
Total: 6.4 Billion BP
- Mutation Rate:  
100 mutations per generation  
or  
1 mutation per 64 million BP per generation



### Base Pairs

### Bases:

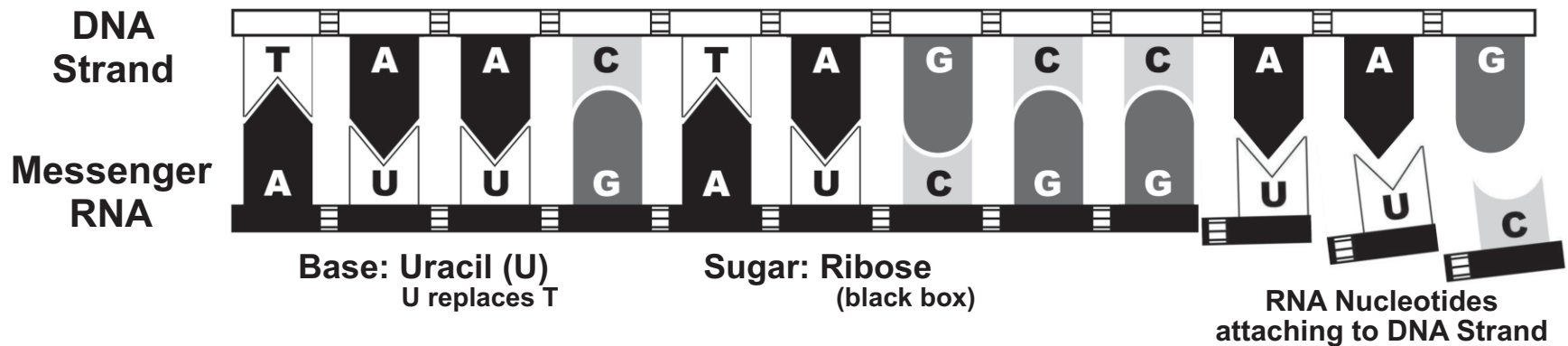
A: Adenine  
T: Thymine  
G: Guanine  
C: Cytosine

### Phosphate

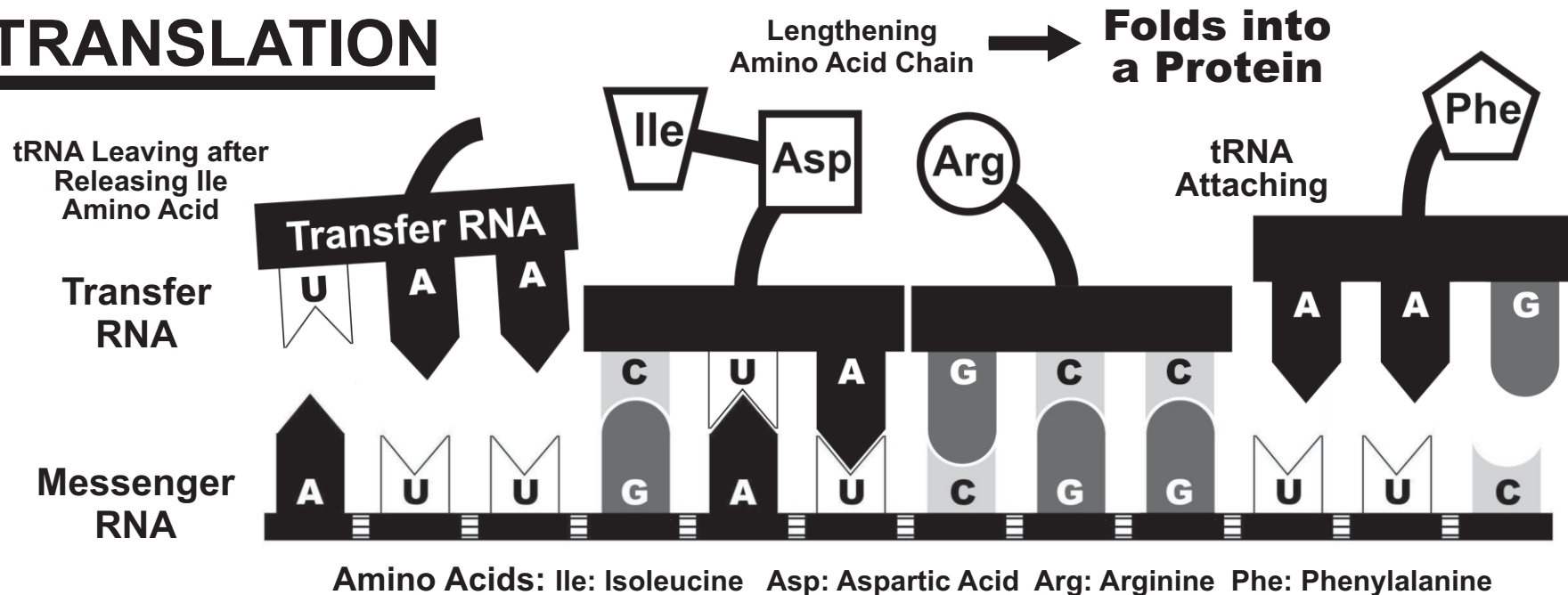
Sugar:  
Deoxyribose

DNA Nucleotide:  
Phosphate +  
Sugar +  
Base

# TRANSCRIPTION



# TRANSLATION

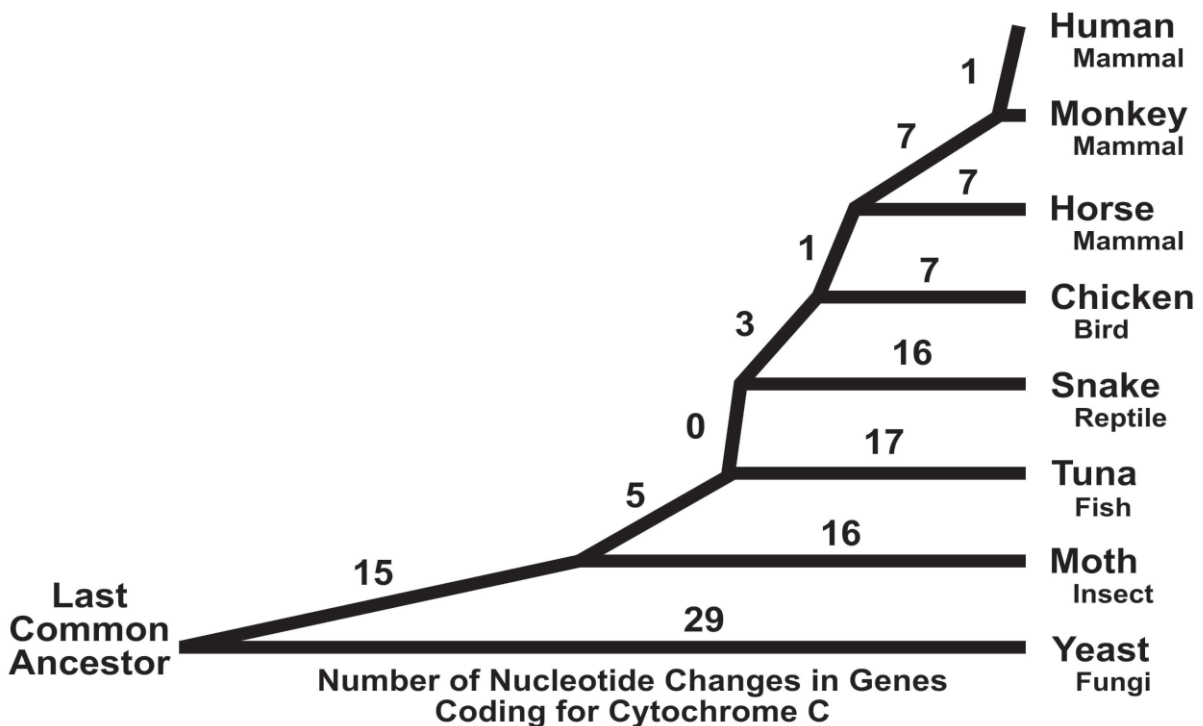


# CYTOCHROME C AMINO ACIDS

## HUMAN, MONKEY & HORSE

Amino Acids 1-8 Not in Mammals			9	10		20
	<b>Human</b>		Gly-Asp-Val-Glu-Lys-Gly-Lys-Lys-Ile-Phe-Ile-Met-			
	<b>Monkey</b>		Gly-Asp-Val-Glu-Lys-Gly-Lys-Lys-Ile-Phe-Ile-Met-			
	<b>Horse</b>		Gly-Asp-Val-Glu-Lys-Gly-Lys-Lys-Ile-Phe-Val-Gln-			
21			30			40
Lys-Cys-Ser-Gln-Cys-His-Thr-Val-Glu-Lys-Gly-Gly-Lys-His-Lys-Thr-Gly-Pro-Asn-Lue-						
Lys-Cys-Ser-Gln-Cys-His-Thr-Val-Glu-Lys-Gly-Gly-Lys-His-Lys-Thr-Gly-Pro-Asn-Lue-						
Lys-Cys-Ala-Gln-Cys-His-Thr-Val-Glu-Lys-Gly-Gly-Lys-His-Lys-Thr-Gly-Pro-Asn-Lue-						
41			50			60
His-Gly-Leu-Phe-Gly-Arg-Lys-Thr-Gly-Gln-Ala-Pro-Gly-Tyr-Ser-Tyr-Thr-Ala-Ala-Asn-						
His-Gly-Leu-Phe-Gly-Arg-Lys-Thr-Gly-Gln-Ala-Pro-Gly-Tyr-Ser-Tyr-Thr-Ala-Ala-Asn-						
His-Gly-Leu-Phe-Gly-Arg-Lys-Thr-Gly-Gln-Ala-Pro-Gly-Phe-Thr-Tyr-Thr-Asp-Ala-Asn-						
61			70			80
Lys-Asn-Lys-Gly-Ile-Ile-Trp-Gly-Glu-Asp-Thr-Leu-Met-Glu-Tyr-Leu-Glu-Asn-Pro-Lys-						
Lys-Asn-Lys-Gly-Ile-Thr-Trp-Gly-Glu-Asp-Thr-Leu-Met-Glu-Tyr-Leu-Glu-Asn-Pro-Lys-						
Lys-Asn-Lys-Gly-Ile-Thr-Trp-Lys-Glu-Glu-Thr-Leu-Met-Glu-Tyr-Leu-Glu-Asn-Pro-Lys-						
81			90			100
Lys-Tyr-Ile-Pro-Gly-Thr-Lys-Met-Ile-Phe-Val-Gly-Ile-Lys-Lys-Lys-Glu-Glu-Arg-Ala-						
Lys-Tyr-Ile-Pro-Gly-Thr-Lys-Met-Ile-Phe-Val-Gly-Ile-Lys-Lys-Lys-Glu-Glu-Arg-Ala-						
Lys-Tyr-Ile-Pro-Gly-Thr-Lys-Met-Ile-Phe-Ala-Gly-Ile-Lys-Lys-Lys-Thr-Glu-Arg-Glu-						
101			110			
Asp-Leu-Ile-Ala-Tyr-Leu-Lys-Lys-Ala-Thr-Asn-Glu			<b>Human</b>			
Asp-Leu-Ile-Ala-Tyr-Leu-Lys-Lys-Ala-Thr-Asn-Glu			<b>Monkey</b>			
Asp-Leu-Ile-Ala-Tyr-Leu-Lys-Lys-Ala-Thr-Asn-Glu			<b>Horse</b>			

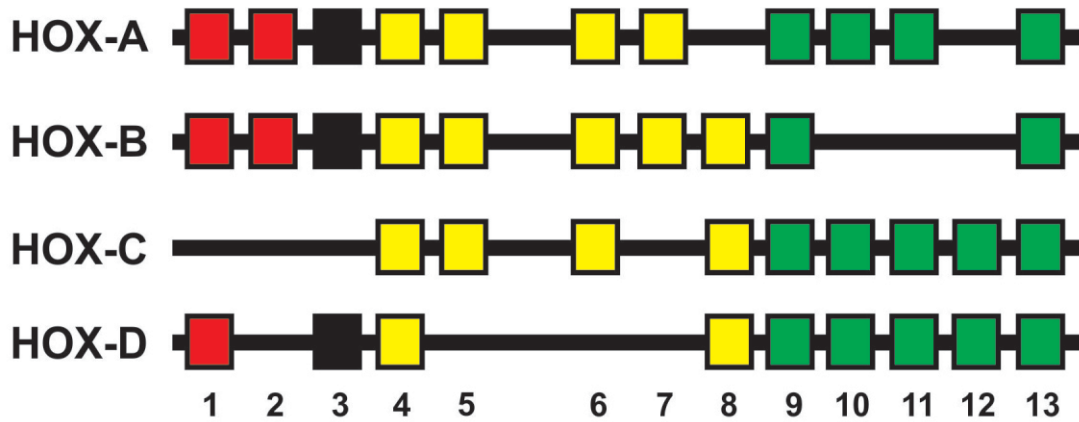
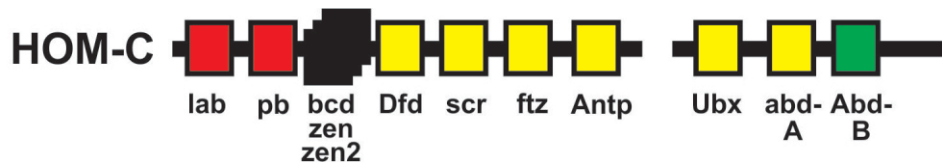
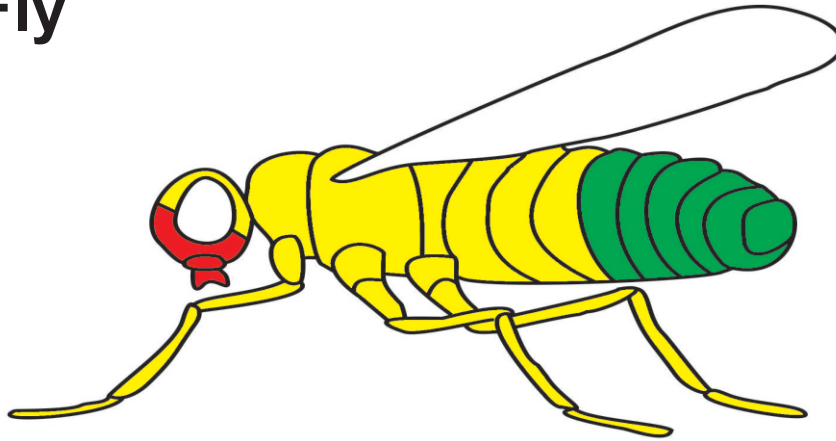
## EVOLUTION OF CYTOCHROME C



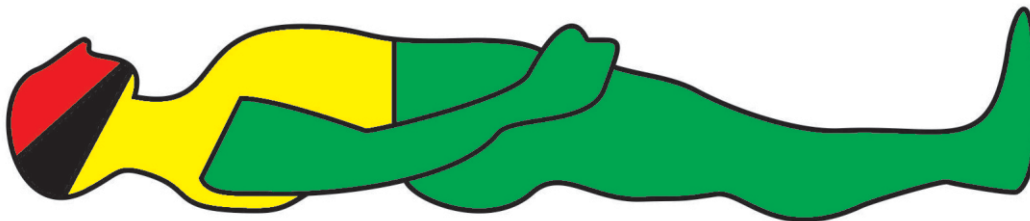


# BODY PLAN GENES

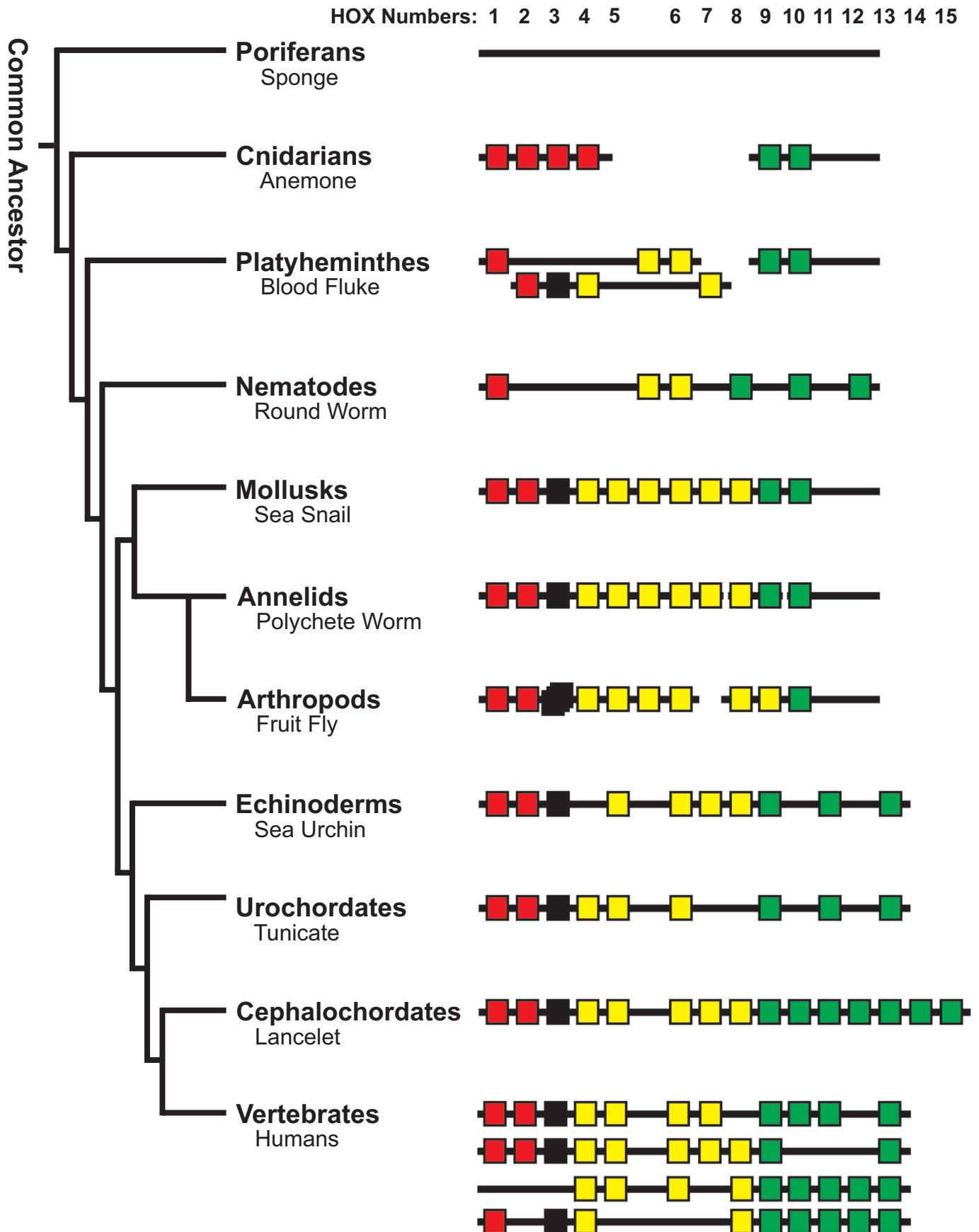
## Fruit Fly



## Human



# EVOLUTION OF BODY PLAN GENES





# COSMOLOGICAL EVOLUTION

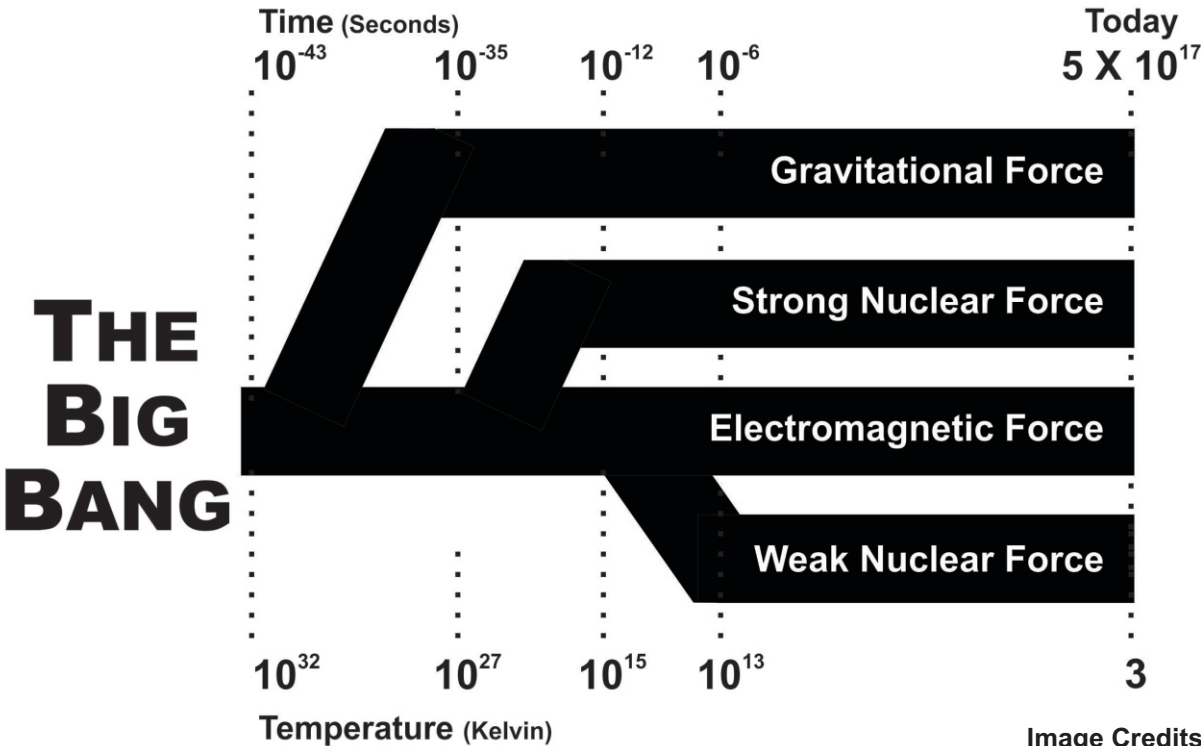
## NUCLEOSYNTHESIS

### PREDICTIONS & OBSERVATIONS OF RATIOS BETWEEN LIGHT ELEMENTS

Element Ratio	Prediction	Observation
<sup>4</sup> He/H	0.247	0.245
<sup>2</sup> H/H	0.0000246	0.0000253
<sup>3</sup> He/H	0.0000107	0.0000110
<sup>7</sup> Li/H	0.00000000056	0.00000000016

H: Hydrogen    He: Helium:    Li: Lithium

## THE BIG BANG & EMERGENCE OF FOUR FORCES OF NATURE



# EVIDENCE FOR FINE-TUNING OF THE UNIVERSE

**Hugh Ross, *The Creator & The Cosmos***

(Colorado Springs, CO: NavPress, 1993), 111-114.

*More than two dozen parameters for the universe must have values falling within narrowly defined ranges for life of any kind to exist.*

## **Gravitational Force Constant**

*if larger:* stars would be too hot and would burn up too quickly and too unevenly

*if smaller:* stars would remain so cool that nuclear fusion would never ignite, hence no heavy element production

## **Strong Nuclear Force Constant**

*if larger:* no hydrogen; nuclei essential for life would be unstable

*if smaller:* no elements other than hydrogen

## **Weak Nuclear Force Constant**

*if larger:* too much hydrogen converted to helium in big bang, hence too much heavy element material made by star burning; no expulsion of heavy elements from stars

*if smaller:* too little helium produced from big bang, hence too little heavy element material made by star burning; no expulsion of heavy elements from stars

## **Electromagnetic Force Constant**

*if larger:* insufficient chemical bonding; elements more massive than boron would be too unstable for fission

*if smaller:* insufficient chemical bonding

## **Ratio of Electromagnetic Force Constant to Gravitational Force Constant**

*if larger:* no stars less than 1.4 solar masses, hence short stellar life spans and uneven stellar luminosities

*if smaller:* no stars more than 0.8 solar masses, hence no heavy element production

## **Ratio of Electron to Proton Mass**

*if larger:* insufficient chemical bonding

*if smaller:* insufficient chemical bonding

## **Ratio of Protons to Electrons**

*if larger:* electromagnetism would dominate gravity, preventing galaxy, star, and planet formation

*if smaller:* electromagnetism would dominate gravity, preventing galaxy, star, and planet formation

## **Expansion Rate of the Universe**

*if larger:* no galaxy formation

*if smaller:* universe would collapse prior to star formation

## **Entropy Level of the Universe**

*if smaller:* no proto-galaxy formation

*if larger:* no star condensation within the proto-galaxies

## **Mass Density of the Universe**

*if larger:* too much deuterium from big bang, hence stars burn too rapidly

*if smaller:* insufficient helium from big bang, hence too few heavy elements forming

## **Velocity of Light**

*if faster:* stars would be too luminous

*if slower:* stars would not be luminous enough

## **Age of the Universe**

*if older:* no solar-type stars in a stable burning phase in the right part of the galaxy

*if younger:* solar-type stars in a stable burning phase would not yet have formed

## **Initial Uniformity of Radiation**

*if smoother:* stars, star clusters, and galaxies would not have formed

*if coarser:* universe by now would be mostly black holes and empty space

## **Fine Structure Constant**

*if larger:* no stars more than 0.7 solar masses

*if smaller:* no stars less than 1.8 solar masses

## **Average Distance between Stars**

*if larger:* heavy element density too thin for rocky planets to form

*if smaller:* planetary orbits would become destabilized

## **Decay Rate of the Proton**

*if greater:* life would be exterminated by the release of radiation

*if smaller:* insufficient matter in the universe for life

## **Carbon (<sup>12</sup>C) to Oxygen (<sup>16</sup>O) Energy Level Ratio**

*if larger:* insufficient oxygen

*if smaller:* insufficient carbon

## **Ground State Energy Level for Helium (<sup>4</sup>He)**

*if larger:* insufficient carbon and oxygen

*if smaller:* insufficient carbon and oxygen

## **Decay Rate of Beryllium (<sup>9</sup>Be)**

*if slower:* heavy element fusion would generate catastrophic explosions in all the stars

*if faster:* no element production beyond beryllium and, hence, no life chemistry possible

## **Mass excess of the Neutron over the Proton**

*if greater:* neutron decay would leave too few neutrons to form the heavy elements essential for life

*if smaller:* proton decay would cause all stars to collapse rapidly into neutron stars or black holes

## **Initial Excess of Nucleons over Anti-Nucleons**

*if greater:* too much radiation for planets to form

*if smaller:* not enough matter for galaxies or stars to form

## **Polarity of the Water Molecule**

*if greater:* heat of fusion and vaporization would be too great for life to exist

*if smaller:* heat of fusion and vaporization would be too small for life's existence; liquid water would become too inferior a solvent for life chemistry to proceed; ice would not float, leading to a runaway freeze-up

## **Supernovae Eruptions**

*if too close:* radiation would exterminate life on the planet

*if too far:* not enough heavy element ashes for the formation of rocky planets

*if too frequent:* life on the planet would be exterminated

*if too infrequent:* not enough heavy element ashes for the formation of rocky planets

*if too late:* life on the planet would be exterminated by radiation

*if too soon:* not enough heavy element ashes for the formation of rocky planets

## **White Dwarf Binaries**

*if too few:* insufficient fluorine produced for life chemistry to proceed

*if too many:* disruption of planetary orbits from stellar density; life on the planet would be exterminated

*if too soon:* not enough heavy elements made for efficient fluorine production

*if too late:* fluorine made too late for incorporation in protoplanet

## **Ratio of Exotic to Ordinary Matter**

*if smaller:* galaxies would not form

*if larger:* universe would collapse before solar type stars could form

# EVIDENCE FOR DESIGN IN THE GALAXY-SUN- EARTH-MOON SYSTEM FOR LIFE SUPPORT

Hugh Ross, *The Creator & The Cosmos*

(Colorado Springs, CO: NavPress, 1993), 129-132.

*The following parameters must have values that fall within a narrowly defined ranges for life to exist.*

## Galaxy Type

*if too elliptical:* star formation would cease before sufficient heavy element build-up for life chemistry

*if too irregular:* radiation exposure on occasion would be too severe and heavy elements for life chemistry would not be available

## Supernova Eruptions

*if too close:* life on the planet would be exterminated by radiation

*if too far:* not enough heavy element ashes would exist for the formation of rocky planets

*if too frequent:* life on the planet would be exterminated

*if too infrequent:* not enough heavy element ashes would be present for the formation of rocky planets

*if too late:* life on the planet would be exterminated by radiation

*if too soon:* not enough heavy element ashes would exist for the formation of rocky planets

## White Dwarf Binaries

*if too few:* insufficient fluorine would be produced for life chemistry to proceed

*if too many:* planetary orbits would be disrupted by stellar density; life on the planet would be exterminated

*if too soon:* not enough heavy elements would be made for efficient fluorine production

*if too late:* fluorine would be made too late for incorporation in protoplanet

## Parent Star Distance from Centre of Galaxy

*if farther:* quantity of heavy elements would be insufficient to make rocky planets

*if closer:* galactic radiation would be too great; stellar density would disturb planetary orbits out of life support zones

## Number of Stars in the Planetary System

*if more than one:* tidal interactions would disrupt planetary orbits

*if less than one:* heat produced would be insufficient for life

## Parent Star Birth Date

*if more recent:* star would not yet have reached stable burning phase; stellar system would contain too many heavy elements

*if less recent:* stellar system would not contain enough heavy elements

## Parent Star Age

*if older:* luminosity of star would change too quickly

*if younger:* luminosity of star would change too quickly

## Parent Star Mass

*if greater:* luminosity of star would change too quickly; star would burn too rapidly

*if less:* range of distances appropriate for life would be too narrow; tidal forces would disrupt the rotational period for a planet of the right distance; uv radiation would be inadequate for plants to make sugars and oxygen

## Parent Star Color

*if redder:* photosynthetic response would be insufficient

*if bluer:* photosynthetic response would be insufficient

## Parent Star Luminosity Relative to Speciation

*if increases too soon:* would develop runaway greenhouse

*if increases too late:* would develop runaway glaciation

## Age

*if too young:* planet would rotate too rapidly

*if too old:* planet would rotate too slowly

## Magnetic Field

*if stronger:* electromagnetic storms would be too severe

*if weaker:* ozone shield and life on the land would be inadequately protected from hard stellar and solar radiation

## Inclination of Orbit

*if too great:* temperature differences would be too extreme

## Distance from Parent Star

*if farther:* planet would be too cool for a stable water cycle

*if closer:* planet would be too warm for a stable water cycle

## Orbital Eccentricity

*if too great:* seasonal temperature differences would be too extreme

## Axial Tilt

*if greater:* surface temperature differences would be too great

*if less:* surface temperature differences would be too great

## Rotation Period

*if longer:* diurnal temperature differences would be too great

*if shorter:* atmospheric wind velocities would be too great

## Thickness of Crust

*if thicker:* too much oxygen would be transferred from the atmosphere to the crust

*if thinner:* volcanic and tectonic activity would be too great

**Albedo** (reflected light to total amount falling on surface)

*if greater:* runaway glaciation would develop

*if less:* runaway greenhouse effect would develop

## Collision Rate with Asteroids & Comets

*if greater:* too many species would become extinct

*if less:* crust would be too depleted of materials for life

## Surface Gravity (Escape Velocity)

*if stronger:* planet's atmosphere would retain too much ammonia and methane

*if weaker:* planet's atmosphere would lose too much water

## Oxygen to Nitrogen Ratio in Atmosphere

*if larger:* advanced life functions would proceed too quickly

*if smaller:* advanced life functions would proceed too slowly

## Carbon Dioxide Level in Atmosphere

*if greater:* runaway greenhouse effect would develop

*if less:* plants would be unable to maintain efficient photosynthesis

## Water Vapor Level in Atmosphere

*if greater:* runaway greenhouse effect would develop

*if less:* rainfall would be too meager for advanced life

## Atmospheric Electric Discharge Rate

*if greater:* too much fire destruction would occur

*if less:* too little nitrogen would be fixed in the atmosphere

## Ozone Level in Atmosphere

*if greater:* surface temperatures would be too low

*if less:* surface temperatures would be too high; there would be too much uv radiation at the surface

## Oxygen Quantity in Atmosphere

*if greater:* plants and hydrocarbons would burn up too easily

*if less:* advanced animals would have too little to breathe

## Seismic Activity

*if greater:* too many life forms would be destroyed

*if less:* nutrients on ocean floors (from river runoff) would not be recycled to the continents through tectonic uplift

## Oceans-to-Continents Ratio

*if greater:* diversity & complexity of life forms would be limited

*if smaller:* diversity & complexity of life forms would be limited

## Global Distribution of Continents

*if too much in the southern hemisphere:* seasonal temperature differences would be too severe for advanced life

## Gravitational Interaction with a Moon

*if greater:* tidal effects on the oceans, atmosphere, and rotational period would be too severe

*if less:* orbital obliquity changes would cause climatic instabilities; movement of nutrients and life from the oceans to the continents and continents to the oceans would be insufficient; magnetic field would be too weak



# CONVERGENT EVOLUTION INDEX

Simon Conway Morris *Life's Solution: Inevitable Humans in a Lonely Universe*

NY: Cambridge U Press, 2003. 455-461

- African golden mole  
 Afrotheria  
 Afterbirth  
 aggression  
 agriculture  
 accessory retina  
 acute visual zone  
 alciopids  
 aldolase  
 alkaloids  
 allosaurids  
 alfi barrels  
 ambrosia beetles  
 aminoacyl-tRNA  
   synthetases  
 amphibians  
 annelids  
 anolids  
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 blood rete  
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   vision, loss  
 Bombardier beetle  
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 butterflies  
 C4 photosynthesis  
 cactusCaddis fly  
 camera eyes  
 canines  
 cartilage  
 cephalopods ls  
 chameleons  
 Châtelperronian
- chemical  
 chemosensory  
 chimps  
 chitin-binding proteins  
 chrysochlorids  
 cichlids  
 circulatory systems  
 cnidocyst  
 coccoideans  
 cochlea  
 cognitive processes  
 collembolans  
 colobine monkeys  
 commelinoids  
 communication  
 communities  
 compound eyes  
 concerted  
 constructions  
 counter-current  
   systems  
 courtship behaviour  
 crab spider  
 crabs  
 crested auklets  
 crickets  
 crustaceans  
 cryptochromes  
 crystallins  
 cubozoans  
 cultural transmission  
 culture  
 cyanogenic glycosides  
 cytokinases  
 defence  
 descended larynx  
 development  
 dialects  
 dichromacy  
 dinoflagellates  
 diptcrans  
 disgust  
 DM domain factors  
 dolphins  
 double-fertilization  
 duck-billed platypus  
 E. coli  
 ears  
 echidna  
 echolocation  
 ecomorphological  
 eel  
 elastic proteins  
 elastic release  
 electric organs II  
 electrical signals  
 electrocytes  
 electrogenation  
 electroreception  
 elephants  
 Elvis taxa  
 encephalization  
 endosymbiosis  
 endothermy  
 enzyme  
 Ernanodon  
 euphasiids  
 Eurotamandua  
 eusociality  
 expressions of surprise  
 extra-embryonic  
   membranes  
 extra-ocular muscles  
 eye spots  
 eyes  
 farming  
 fibre-optics  
 fiddler crabs  
 finches  
 fish  
 fission-fusion society  
 five-site rule  
 flies  
 flightlessness  
 flowers
- fore-limb/hind-limb  
   separation  
 fore-limb  
   manipulation  
 fovea  
 frogs  
 fruit-flies  
 gall-thrips  
 gas-filled bladders  
 geckos  
 grebes  
 gymnotids  
 gyroscopes  
 haemocyanin  
 haemoglobin  
 halteres  
 hearing  
 heat-sensitive organ  
 helicases  
 hemipterans  
 heteropods  
 heteropterans  
 hexapod gait  
 high-altitude birds  
 HIV proteases  
 hoatzin  
 hominid cultures  
 hominids  
 hooves  
 houseflies  
 humming birds  
 hyaluronan synthase  
 hydrogenosomes  
 hydrostatic skeleton  
 hymenopterans  
 hypocone  
 Indian Red ant  
 ink clouds  
 insect-bacterial  
   association  
 insectivores  
 insectivorous birds  
 insects  
 intelligences  
 island faunas  
 Jamming avoidance  
 response  
 jellyfish  
 jerboas  
 kiwi  
 lacewings  
 lactate  
 dehydrogenases  
 lamprins  
 langur  
 lateral-line systems  
 latex  
 Laurasiatheria  
 leaf-eating  
 leaves  
 lekking  
 lens  
 light-harvesting proteins  
 lilies  
 limb loss  
   limbs  
 lizards  
 locomotion  
 ons  
 luminescence  
 lysozyme  
 malignant hyperthermia  
 'mammal-ness'  
 mammals  
 manipulative skills  
 mantids  
 mantispids  
 marsupial mole  
 marsupials  
 marsupium  
 maternal care  
 matrilineal social systems  
 matrotrophy  
 Mediterranean-style floras  
 megadont
- memory  
 menopause  
 mice  
 migratory birds  
 millipede  
 mimicry  
 mites  
 molars  
 mole  
 mole rat  
 molecular  
 molluscs  
 mormyridsmorphological  
 moths & sphinx moths  
 Milllerian mimicry  
 multicellulanty  
 music  
 myoglobin  
 NADH dehydrogenase  
 naked mole rats  
 necrolestids  
 nectar-feeding bats  
 nectar-feeding birds  
 neural algorithms  
 neural networks  
 neural processing  
 nicotine oxidases  
 nucleotide binding proteins  
 octopus  
 oil droplets, in eye  
 olfaction  
 oryopodid crabs  
 ornihnids  
 ostracods  
 ovoviviparity  
 ovum, minute  
 owls  
 palacanodonts  
 pangolins  
 parallel, versus  
 parental care  
 pathogen-host relationship  
 pectinate claws  
 penis  
 peptidases  
 personalities  
 phorid flies  
 phylogenies  
 physiology  
 pike  
 placenta  
 placentals  
 plants  
 plant eating  
 polarization vision  
 polysaccharide lyases  
 porpoise  
 praying mantis  
 precision grip  
 prc-pollex  
   (Panda's thumb)  
 proteases  
 proteinase inhibitors  
 proteins  
 push-rod  
   mechanoreceptors  
 quorum sensing  
 raptorial  
 red vision  
 red-green vision  
 reflective structures  
 Rensch's rule  
 reproduction  
 resin  
 rhachiberothidids  
 rhodopsin  
 RNA-protein  
 rodents  
 rumen  
 sabellids  
 sabre-tooth cats  
 sandlance  
 sarcophagids  
 sea-bream  
 sea urchin
- seed dispersal  
 seismic communication  
 self-organization, role of  
 self-recognition  
 semicircular canals  
 sharks  
 shrimps  
 sieve tubes  
 silk & silk nets  
 skeletons  
 sleep  
 snails  
 snakes  
 social systems  
 social voles  
 sodium channels  
 somatosensory systems  
 song  
 spectral sensitivities  
 speech  
 sperm whales  
 spherical aberration (eyes)  
 spider-monkey  
 spiders  
 spurge  
 staphylinids  
 star-nosed moles  
 Statocysts  
 steroid signalling  
 strepsipterans  
 structural mimicry  
 super-efficient transport  
 surprise, expressions  
 teeth  
 teiids  
 temperaments  
 tents  
 termite eaters  
 termites  
 terrestrialization  
 threads, adhesive  
 thylacosmilids  
 toe-fringes  
 tools  
 topoisomerases  
 trabecular bone  
 trachea  
 tribosphenic  
 trichromacy  
 trilobites  
 tropical seabirds  
 tuna  
 turret eyes  
 tympanic, ear  
 ultrasound detection  
 uncertainty response  
 ungulate  
 unihemispheric sleep  
 vangids  
 vermivores  
 vertebrates  
 vestibulo-oculomotor reflex  
 vision  
 visual stimuli  
 visual streak  
 visual systems  
 visual tracking  
 viviparity  
 vocal control systems  
 vocal learning  
 vocalizations  
 walking  
 walrus  
 warmbloodedness  
 wasps  
 waste management  
 water-vascular system  
 weaver ants  
 wetas  
 winkle  
 woodpecker  
 'worker policing'  
 worm  
 xenarthran  
 xerophyte

# NATURE & INTELLIGENT DESIGN

## A COMPLEMENTARY RELATIONSHIP

### INTELLIGENT DESIGN

Religion & Philosophy

Ultimate Beliefs



### NATURE

Scientific Discoveries

Beauty, Complexity & Functionality

## ARGUMENT FROM DESIGN TO NATURE

**Presupposition Approach**

Downward Arrows

- assumes ID is true
- views nature through this Metaphysical “Set of Glasses”

## ARGUMENT FROM NATURE TO DESIGN

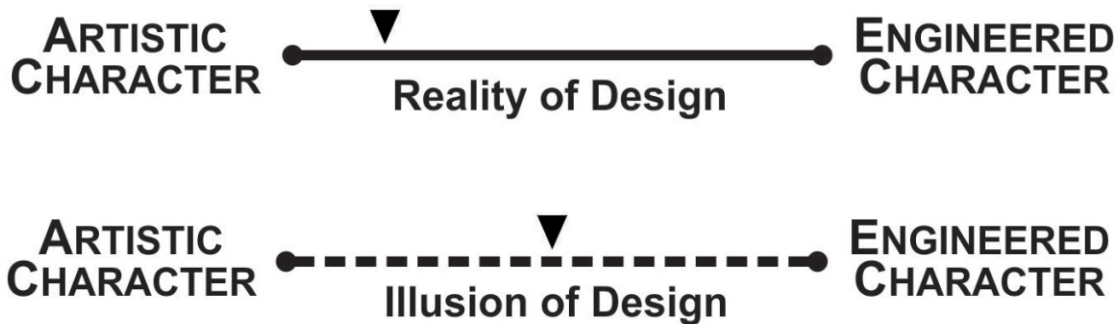
**Evidence Approach**

Upward Arrows

- uses scientific evidence to argue for the belief in ID & an Intelligent Designer
- aka: Argument of Design for God’s Existence



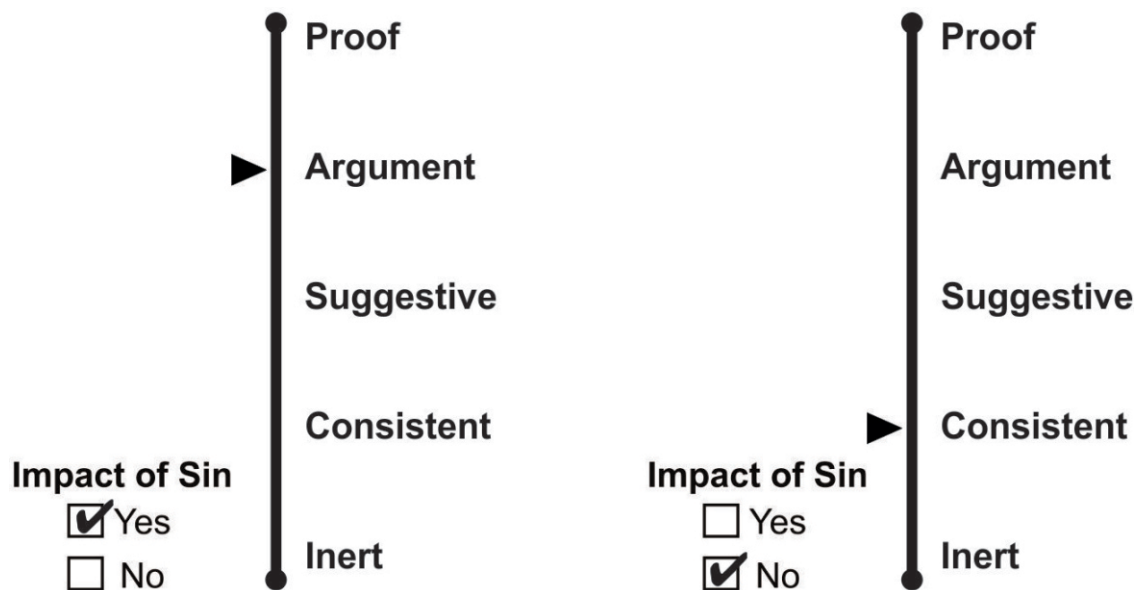
# ONTOLOGICAL PARAMETER OF INTELLIGENT DESIGN



**TOP:** The solid line signifies that design in nature is real. The triangle above the line exemplifies a view of design that is more artistic in character than engineered.

**BOTTOM:** The dashed line indicates that intelligent design in the world is not real but only an illusion. The position of the triangle above the line in the middle between the artistic and engineered poles means that the illusory experience of design includes both of these characteristics.

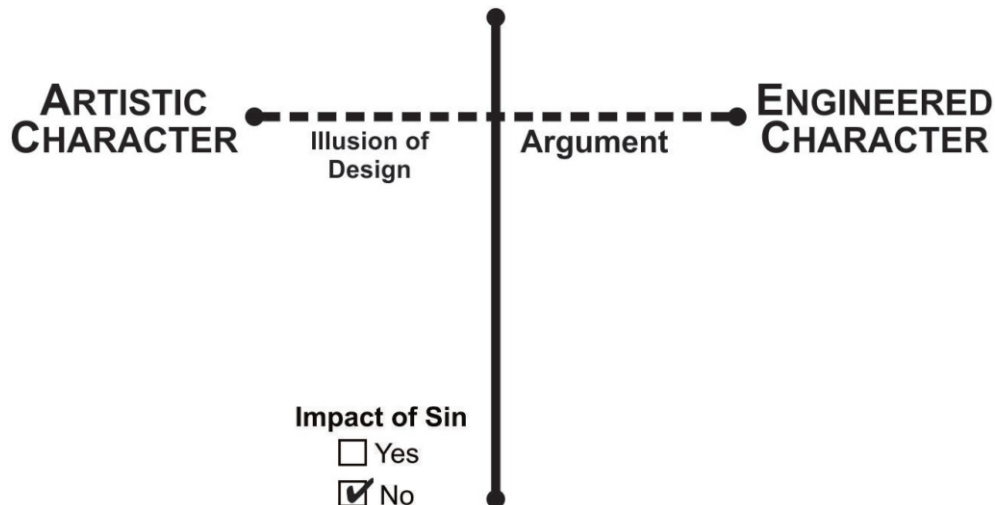
# EPISTEMOLOGICAL PARAMETER OF INTELLIGENT DESIGN



**LEFT:** The position of the triangle signifies that the level of certainty for design is similar to that of a reasonable argument. To use a legal term, design in nature is **BEYOND A REASONABLE DOUBT**. The checked box acknowledges that sin is a factor in dealing with intelligent design.

**RIGHT:** The triangle at a low level on the epistemological parameter indicates that the experience of beauty, complexity & functionality in nature is not that powerful or compelling. In this case, the natural world is only consistent with the belief in ID. The checked box signifies that sin plays no part with ID.

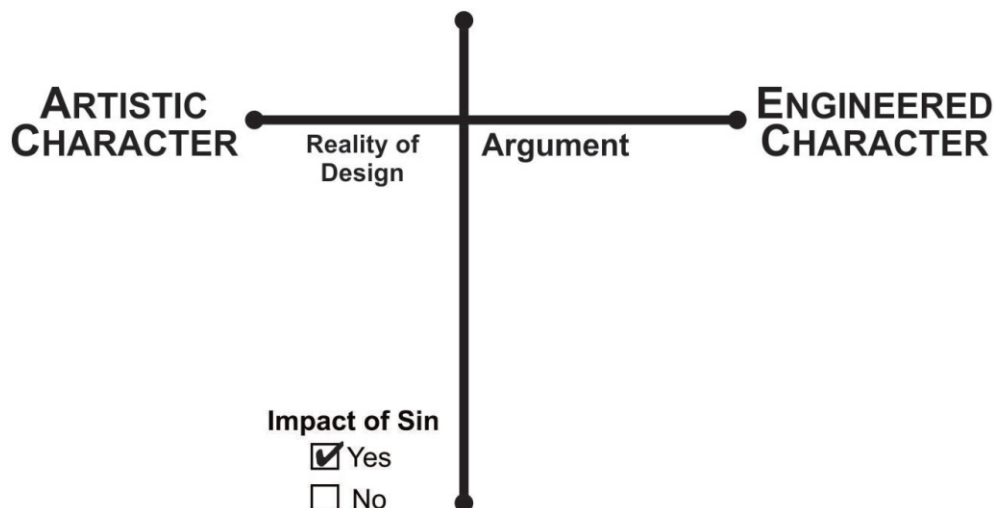
# ID POSITION OF RICHARD DAWKINS



Dawkins believes that intelligent design is merely “apparent” and nothing but an **illusion**, as indicated by the dashed line on the ontological parameter. He acknowledges that this illusion is similar to “works of art” and “feats of engineering,” and that both of these characteristics appear in nature in a balanced way, as reflected by his terms “elegant efficiency” and “complex elegance.” This balance is depicted by the intersection in the middle of the ontological parameter.

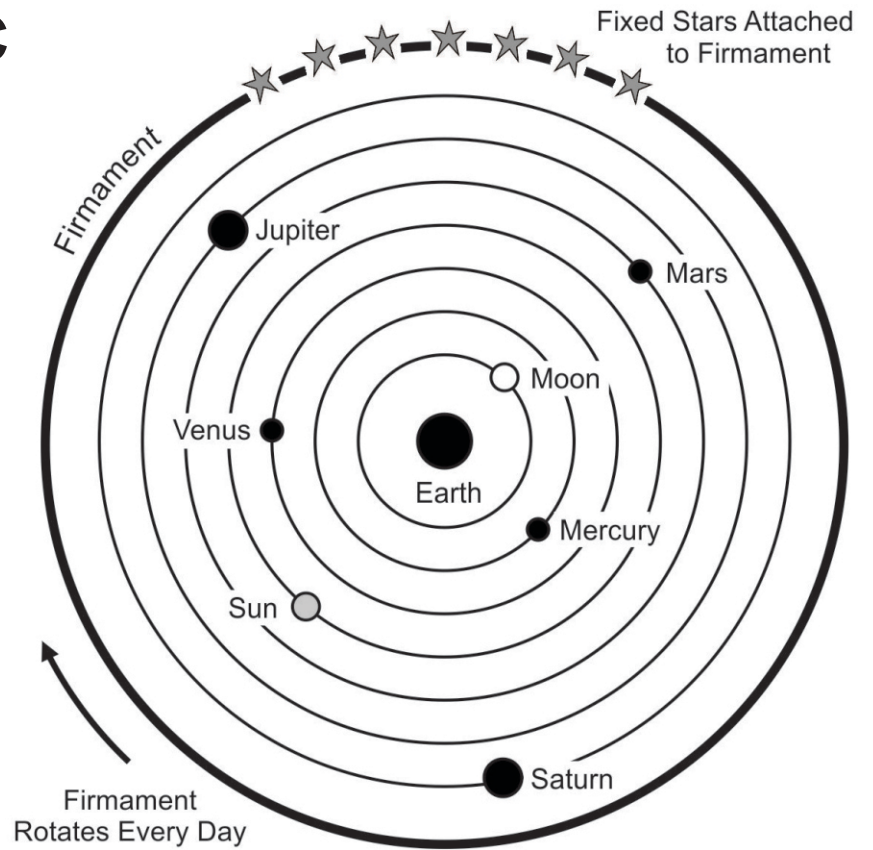
Dawkins acknowledges that nature strikes everyone forcefully, and he contends that this is the “most powerful reason” why most people have believed in a “supernatural deity.” This level of certainty is depicted by the intersection at the level of an **argument** on the epistemological parameter. Dawkins does not believe in sin and it is not a factor in his position on ID.

# ID POSITION OF LAMOUREUX

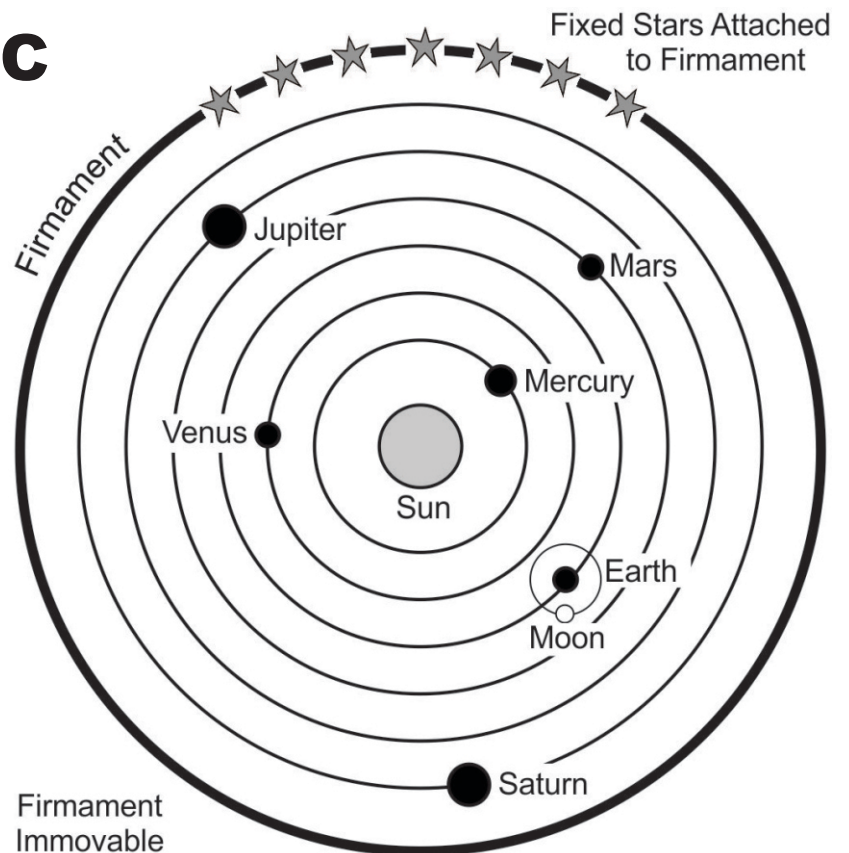


I believe that intelligent design is **real**, as indicated by the solid line on the ontological parameter. Though I appreciate both the artistic and engineered aspects in the world, beauty in nature strikes me a bit harder than complexity and functionality. Thus, the intersection is shifted to the left on the ontological parameter. The intersection at the level of an **argument** on the epistemological parameter recognizes that design in nature is clearly seen by everyone, so much so that we are accountable with regard to the implications of this divine revelation. Therefore, we are “without excuse” if we disregard or dismiss design (Rom 1:20). To use a legal term, I believe that intelligent design in nature is **Beyond a Reasonable Doubt**. I also believe that human sin is a critical factor that influences positions on intelligent design; in particular, the 1<sup>st</sup> Commandment and our relationship or lack of a relationship with God.

# GEOCENTRIC UNIVERSE



# HELIOCENTRIC UNIVERSE



# JAMES DANA'S DAY-AGE THEORY

## *Manual of Geology (1863)*

The order of events in the Scripture cosmogony corresponds essentially with that which has been given. There was first a void and formless earth: this was literally true of the "heavens and the earth," if they were in the condition of a gaseous fluid. The succession is as follows:—

- (1.) Light.
- (2.) The dividing of the waters below from the waters above the earth (the word translated *waters* may mean *fluid*).
- (3.) The dividing of the land and water on the earth.
- (4.) Vegetation; which Moses, appreciating the philosophical characteristic of the new creation distinguishing it from previous inorganic substances, defines as that "which has seed in itself."
- (5.) The sun, moon, and stars.
- (6.) The lower animals, those that swarm in the waters, and the creeping and flying species of the land.
- (7.) Beasts of prey ("creeping" here meaning "prowling").
- (8.) Man.

In this succession, we observe not merely an order of events, like that deduced from science; there is a system in the arrangement, and a far-reaching prophecy, to which philosophy could not have attained, however instructed.

The account recognizes in creation two great eras of three days each,—an *Inorganic* and an *Organic*.

Each of these eras opens with the appearance of *light*: the *first*, light cosmical; the *second*, light from the sun for the special uses of the earth.

The arrangement is, then, as follows:—

### 1. *The Inorganic Era.*

1st Day.—LIGHT cosmical.

2d Day.—The earth divided from the fluid around it, or individualized.

3d Day.— { 1. Outlining of the land and water.  
                  { 2. Creation of vegetation.

### 2. *The Organic Era.*

4th Day.—LIGHT from the sun.

5th Day.—Creation of the lower orders of animals.

6th Day.— { 1. Creation of Mammals.  
                  { 2. Creation of Man.



# DARWIN'S HMS BEAGLE VOYAGE

27 December 1831 to 2 October 1836

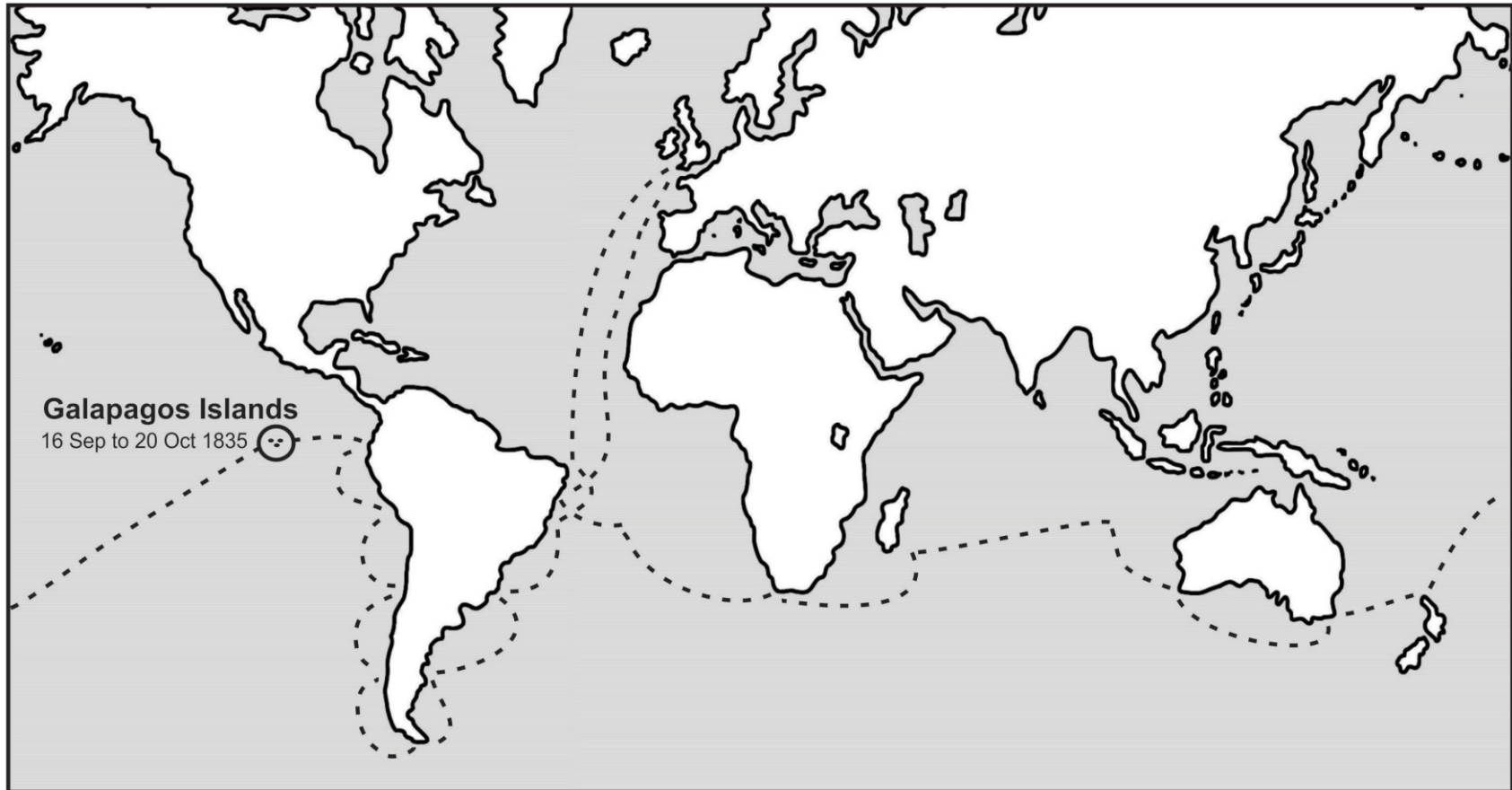


Image Credits p. 96

# DARWIN'S 1879 LETTER TO FORDYCE

Private DAR. 270.1:25  
Down Beckenham  
Kent  
May 7th 1879

Dear Sir

It seems to me absurd to doubt that a man may be an ardent Theist & an evolutionist. — You are right about Kingsley. Asa Gray, the eminent botanist, is another case in point. — What my own views may be is a question of no consequence to any one except myself. —

But as you ask, I may state that my judgment often fluctuates. Moreover whether a man deserves to be called a theist depends on the definition of the term, which is much too large a subject for a note. In my most extreme fluctuations I have never been an atheist in the sense of denying the existence of a God. — I think that generally (& more and more so as I grow older) but not always, that an agnostic would be the most correct description of my state of mind.

Dear Sir  
Yours faithfully  
Ch. Darwin

Down Beckenham | Kent May 7th 1879

Dear Sir

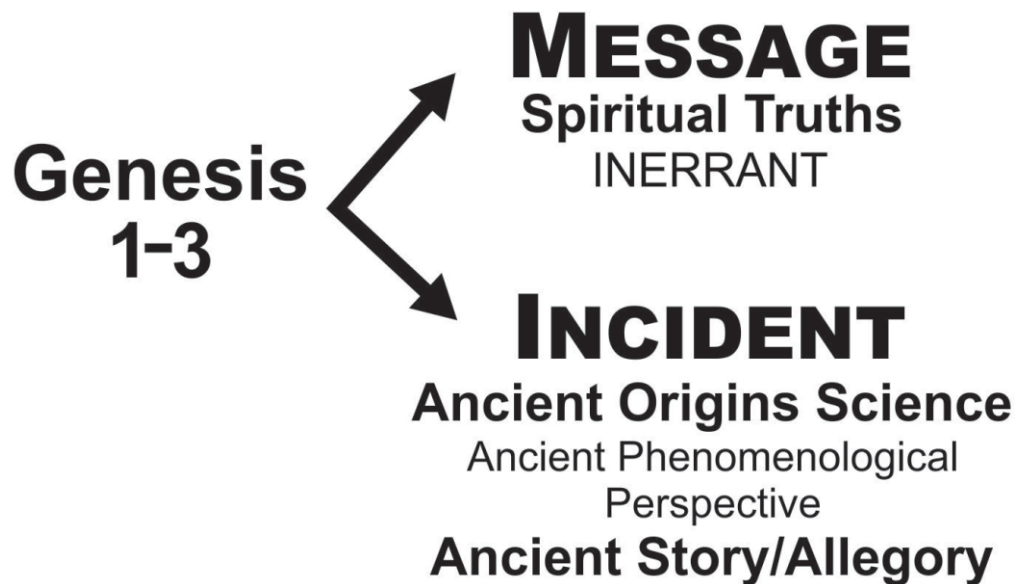
**It seems to me absurd to doubt that a man may be an ardent Theist & an evolutionist.** — You are right about Kingsley. Asa Gray, the eminent botanist, is another case in point — What my own views may be is a question of no consequence to any one except myself. — But as you ask, I may state that my judgment often fluctuates. Moreover whether a man deserves to be called a theist depends on the definition of the term: which is much too large a subject for a note. In my most extreme fluctuations **I have never been an atheist in the sense of denying the existence of a God.** — I think that generally (& more and more so as I grow older) but not always, that an **agnostic** would be the most correct description of my state of mind.

Dear Sir | Yours faithfully | **Ch. Darwin**

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# MESSAGE-INCIDENT PRINCIPLE

## 1<sup>ST</sup> NEW APPLICATION FOR GENESIS 1-3



# MESSAGE-INCIDENT PRINCIPLE

## 2<sup>ND</sup> NEW APPLICATION FOR GENESIS 1-3



# GENESIS 1

## THE PARALLEL PANELS

In the beginning God created the heavens and the earth.  
Now the earth was **FORMLESS** and **EMPTY**, darkness  
was over the surface of the deep, and the Spirit of God  
was hovering over the waters.

Genesis 1:1-2

### 1<sup>ST</sup> PANEL

**Formless**

**Day 1**  
**Separate**  
Light  
Darkness

**Day 2**  
**Separate**  
Waters Above  
Waters Below

**Day 3**  
**Separate**  
Water  
Land

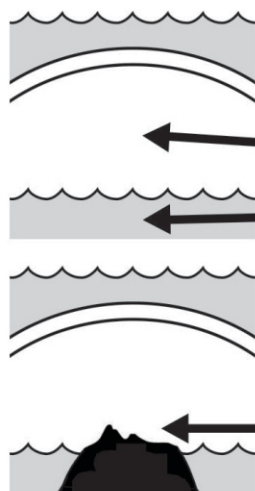
### 2<sup>ND</sup> PANEL

**Empty**

**Day 4**  
**Fill with**  
Sun  
Moon & Stars

**Day 5**  
**Fill with**  
Birds  
Sea Creatures

**Day 6**  
**Fill with**  
Land Animals  
Humans

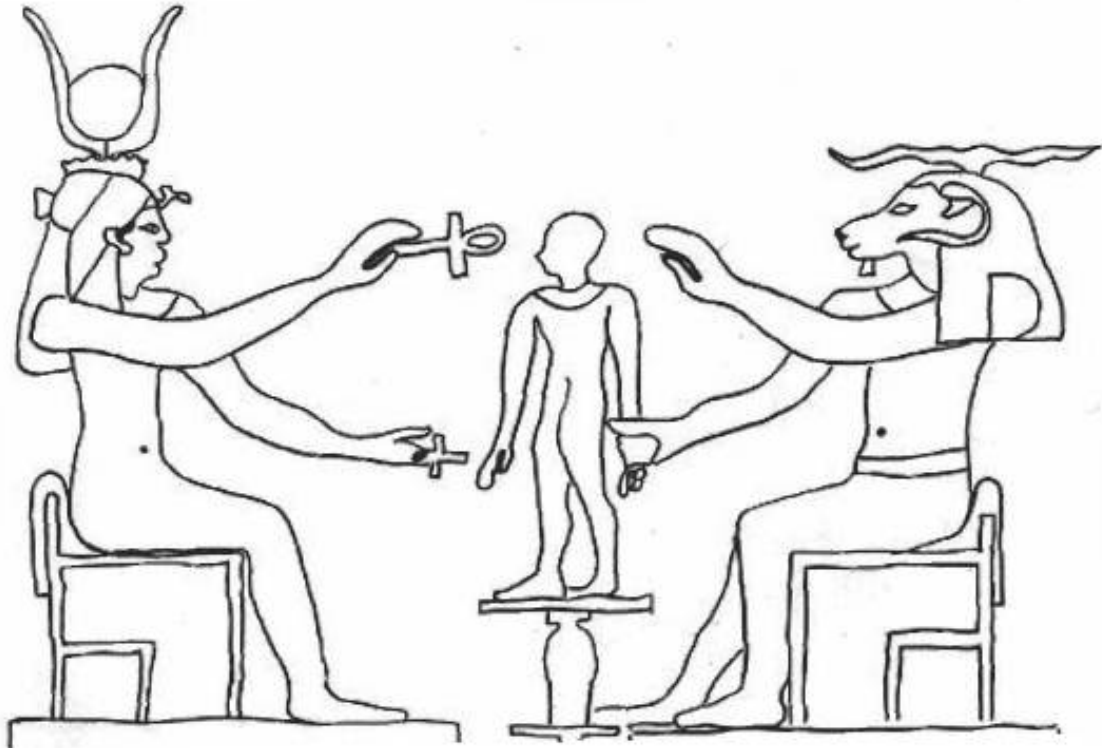


**Day 7**  
**The Sabbath**  
God Rests



## Egyptian Creation of Humans

### Craftsman-Like Mechanism



Isis

Khnum

## Biblical Creation of Humans

### Craftsman-Like Mechanism

#### Genesis 2:7

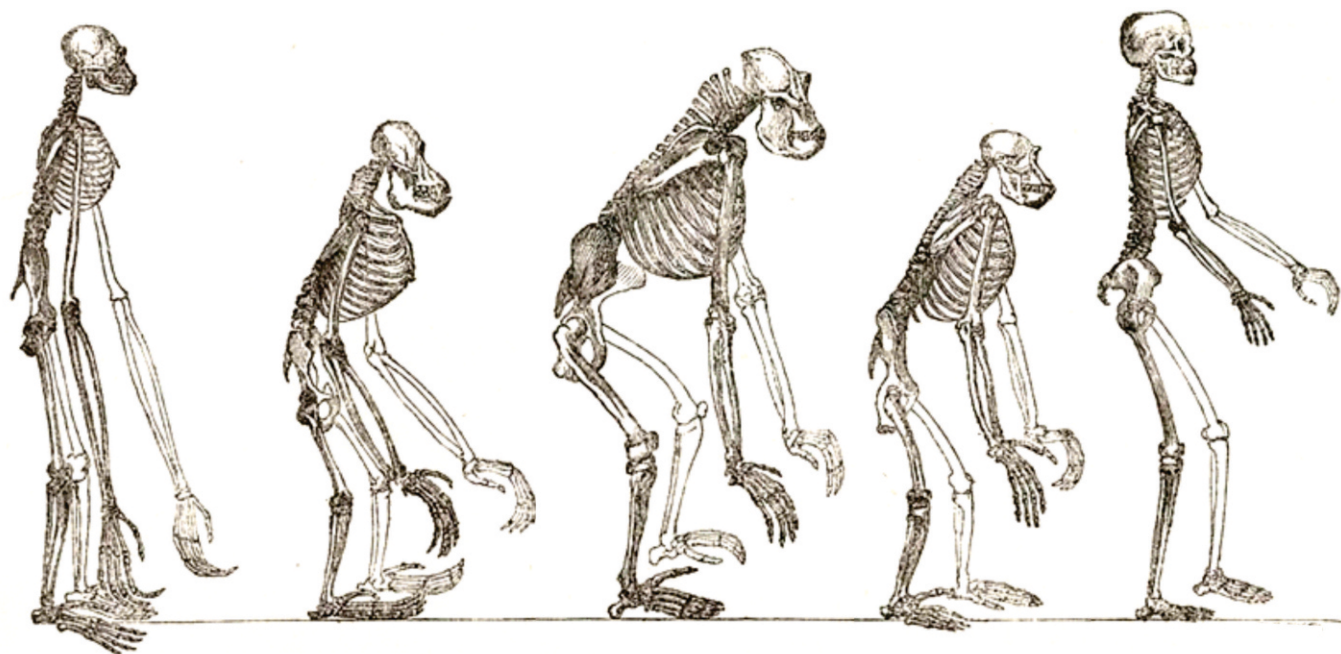
“The Lord God formed [*yatsar*] the man from the **dust of the ground** and breathed into his nostrils the breath of life, and the man [Adam] became a living being.”

#### Isaiah 64:8

“We [humans] are the clay, you [God] are **the Potter**, we are all the work of your hand.”

# HOMOLOGY OF BONES

## APES & HUMAN



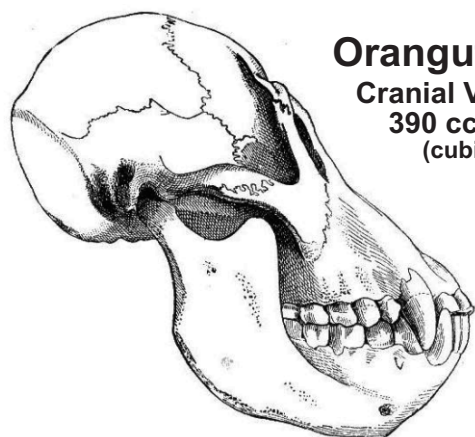
Gibbon

Orangutan

Gorilla

Chimpanzee

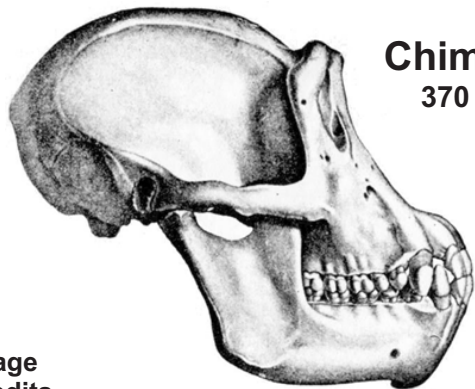
Human



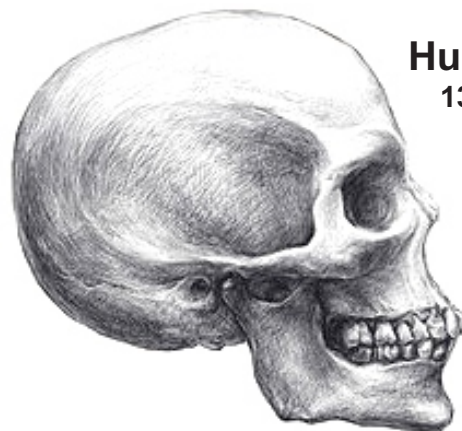
**Orangutan**  
Cranial Volume:  
390 cc  
(cubic centimetres)



**Gorilla**  
550 cc



**Chimpanzee**  
370 cc

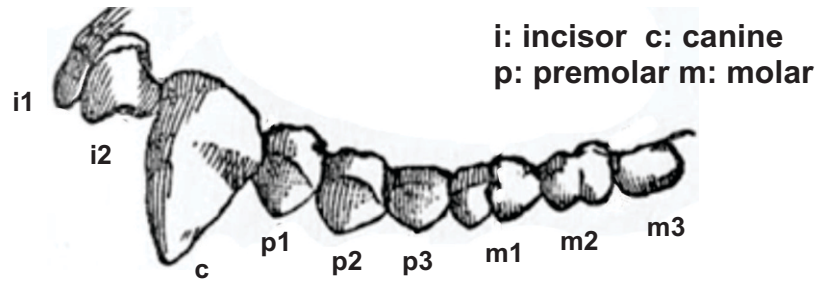


**Human**  
1350 cc

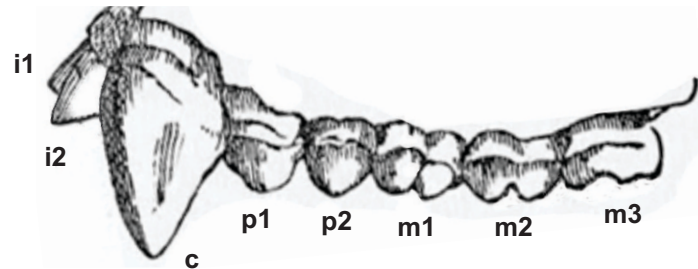
# HOMOLOGY OF TEETH

## MONKEY, GORILLA & HUMAN

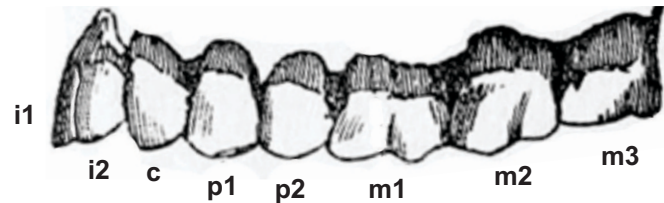
### Monkey



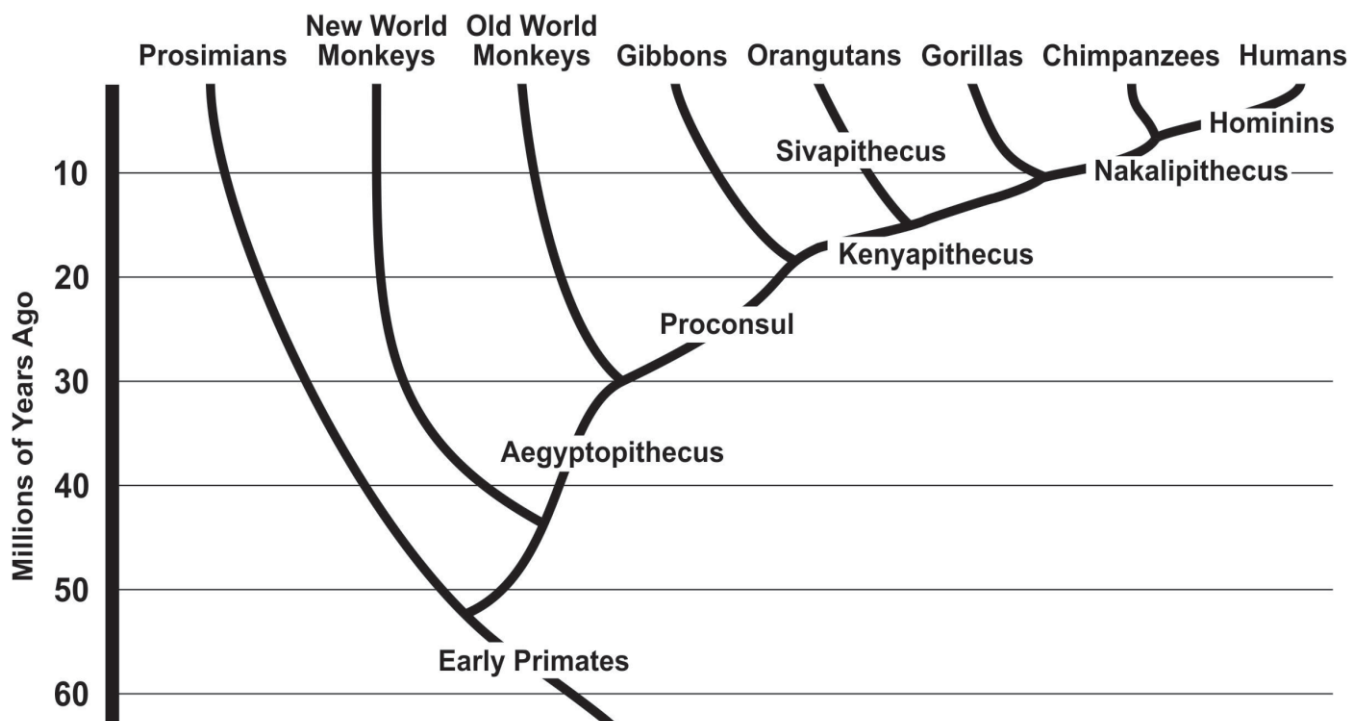
### Gorilla



### Human



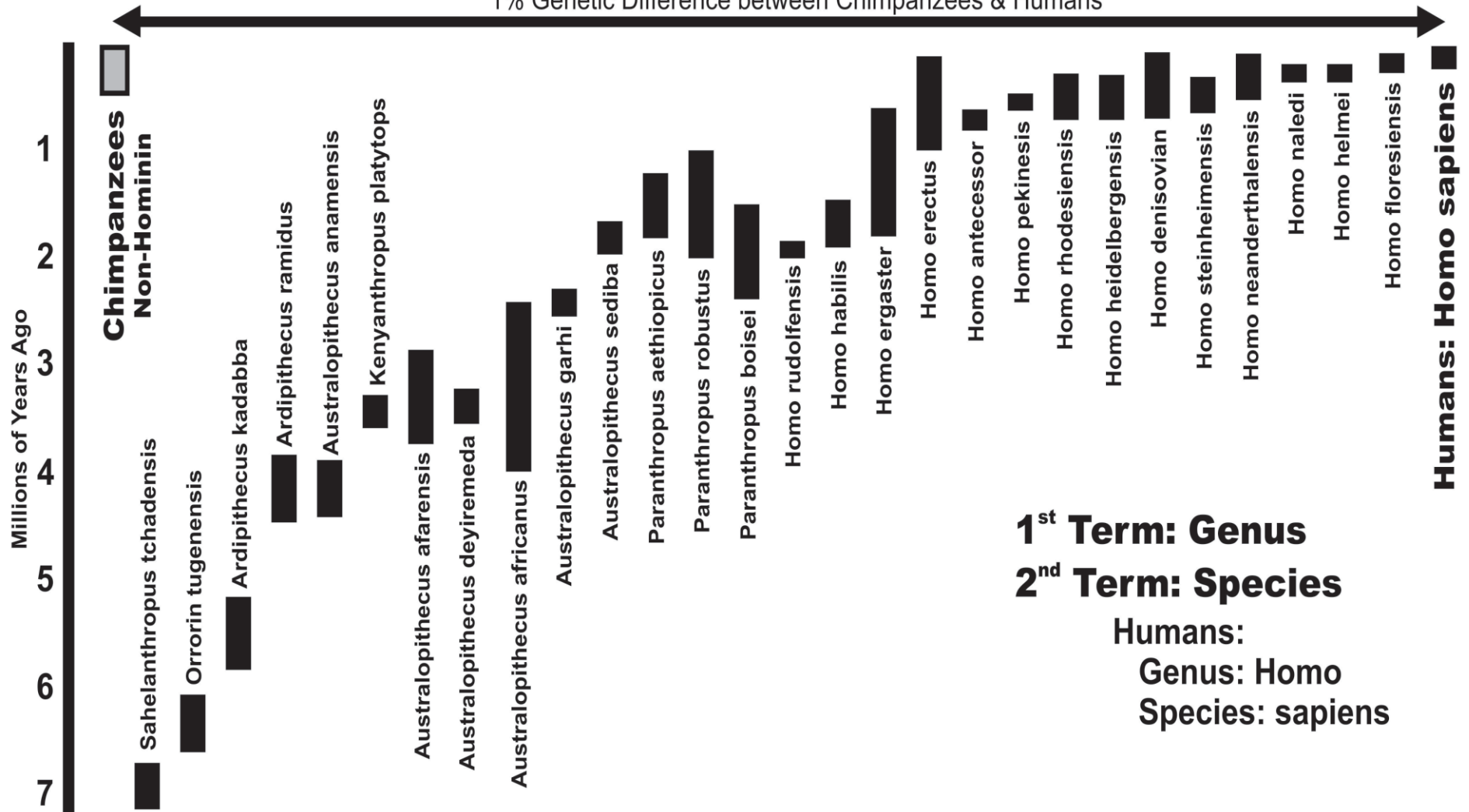
## Evolution of Primates



# EVOLUTION OF HOMININS

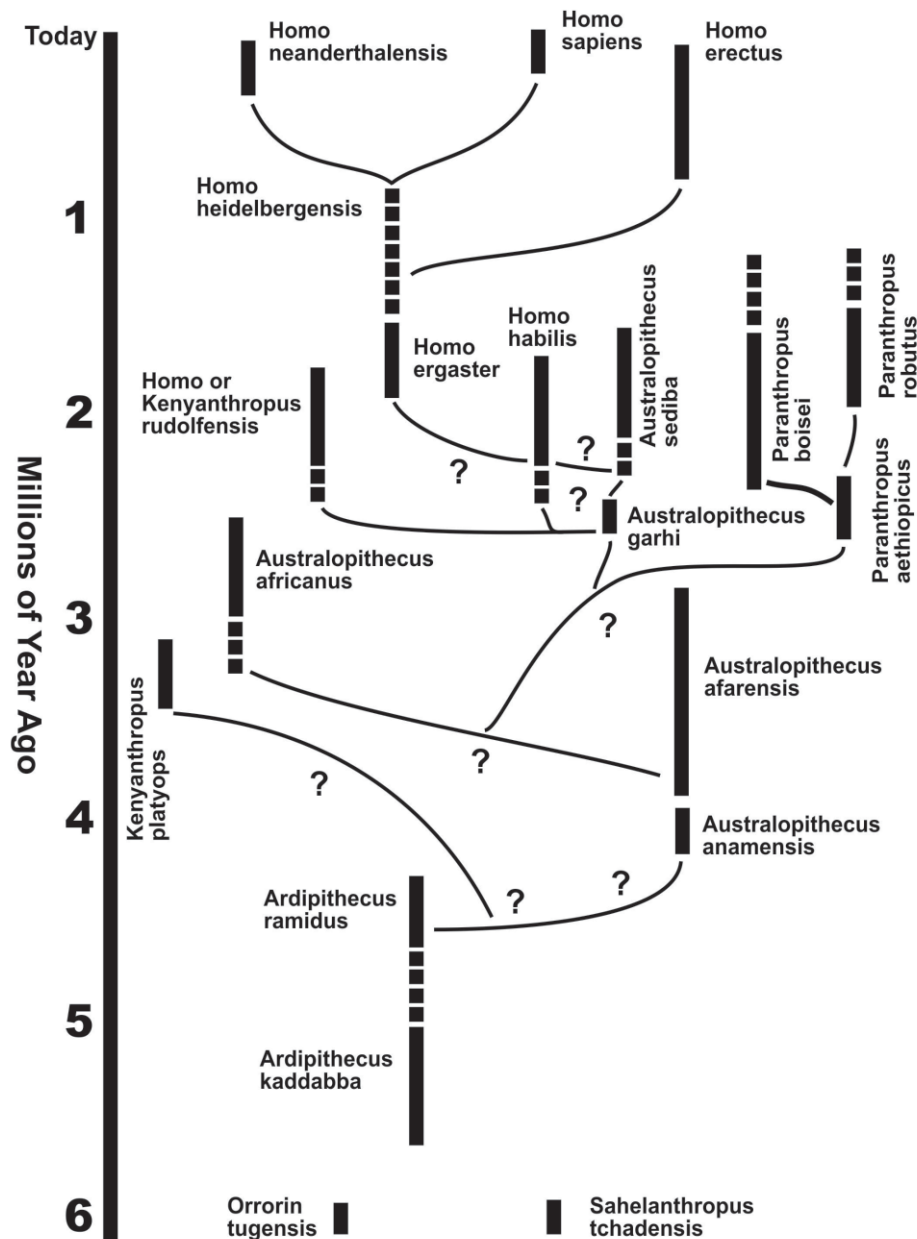
## THE FOSSILS & THEIR DATES

1% Genetic Difference between Chimpanzees & Humans

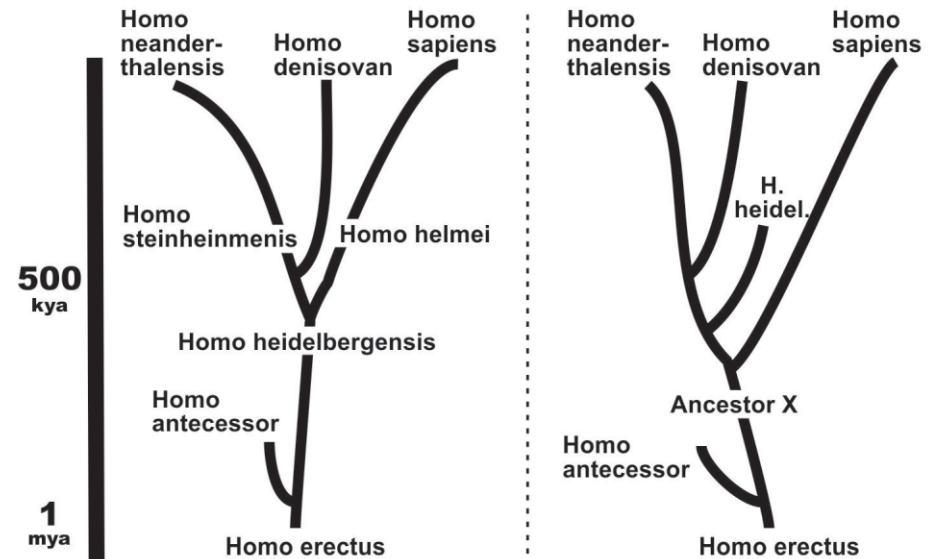




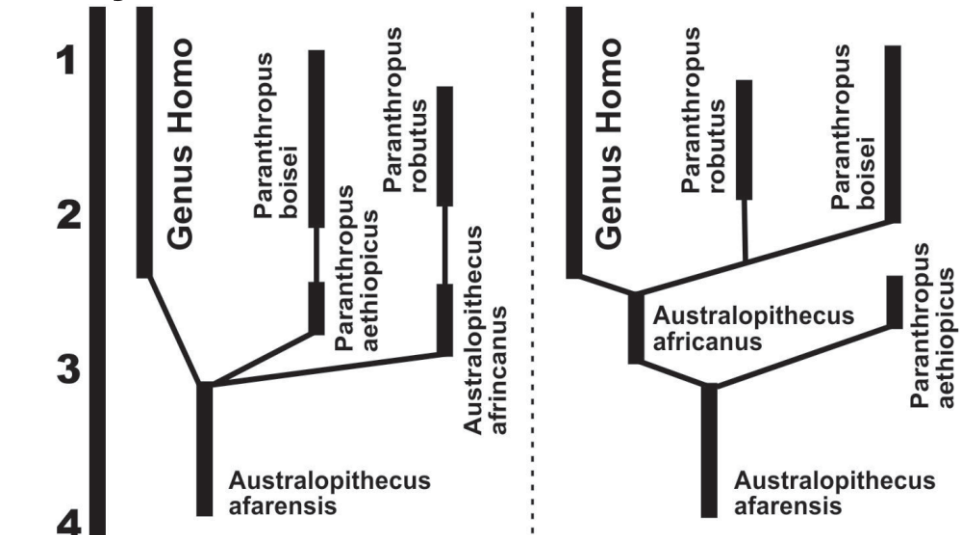
# HOMININ EVOLUTIONARY TREES



## Late Hominins



## Early Hominins



# HOMININ EVOLUTION

## Sahelanthropus tchadensis

6-7 mya

320-380 cc



## Ardipithecus ramidus

4.4 mya

300-350 cc

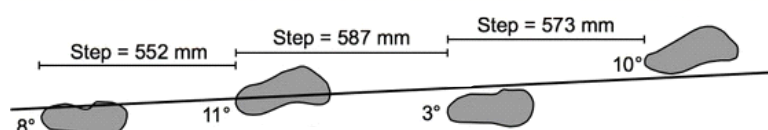


## Australopithecus afarensis

3.7 to 3 mya

375-500 cc

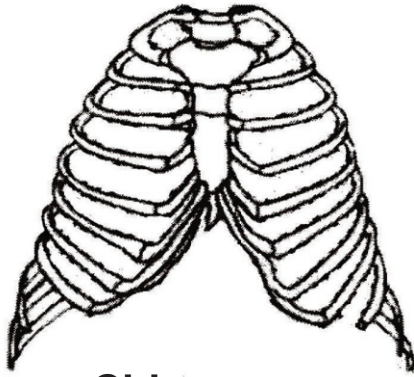
### Laetoli Fossil Footprints (3.6 mya)



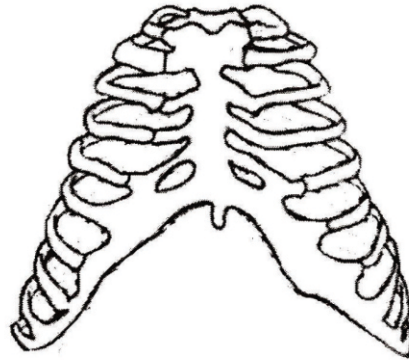
# ANATOMICAL COMPARISONS

## CHIMPANZEE, A. AFARENSIS & HUMAN

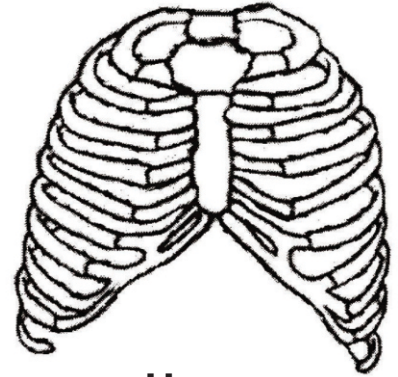
### Rib Cage



Chimpanzee

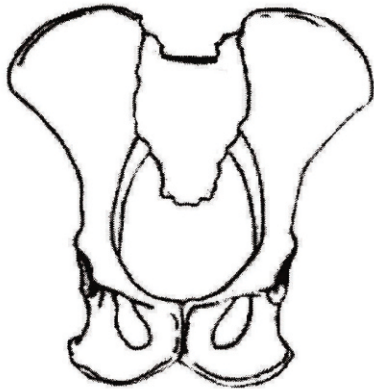


A. afarensis

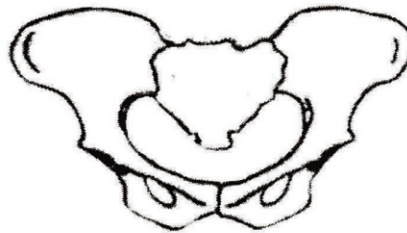


Human

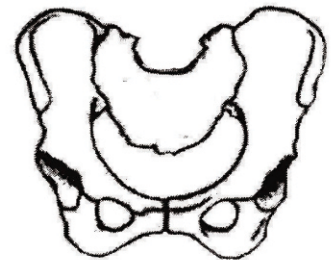
### Hip Bones



Chimpanzee

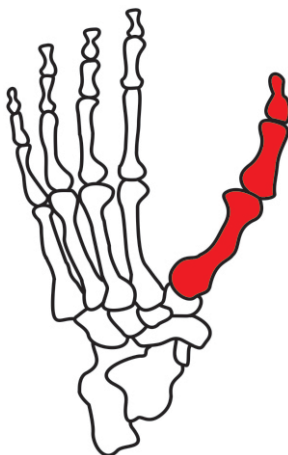


A. afarensis



Human

### Foot & Big Toe



Chimpanzee



A. afarensis



Human



# ANATOMICAL COMPARISONS

## CHIMPANZEE, A. AFARENSIS & HUMAN

### Foramen Magnum



Chimpanzee

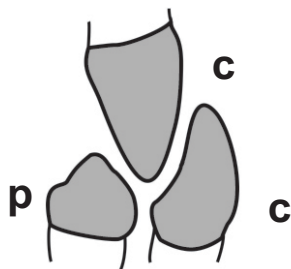


A. afarensis

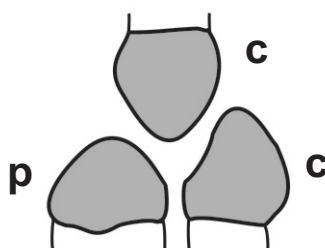


Human

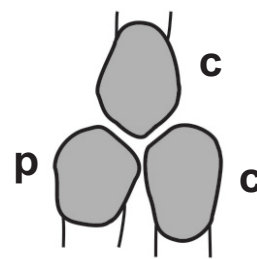
### Upper & Lower Canines & 1<sup>st</sup> Lower Premolar



Chimpanzee

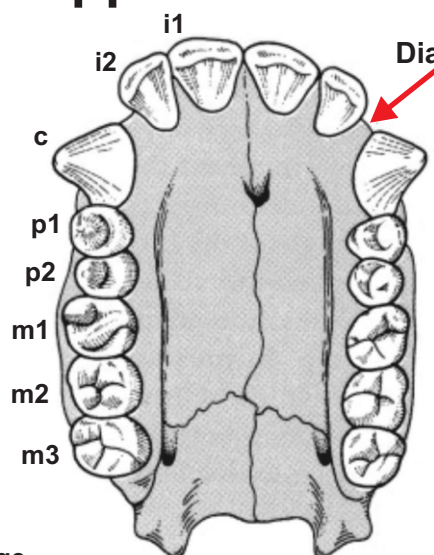


A. afarensis

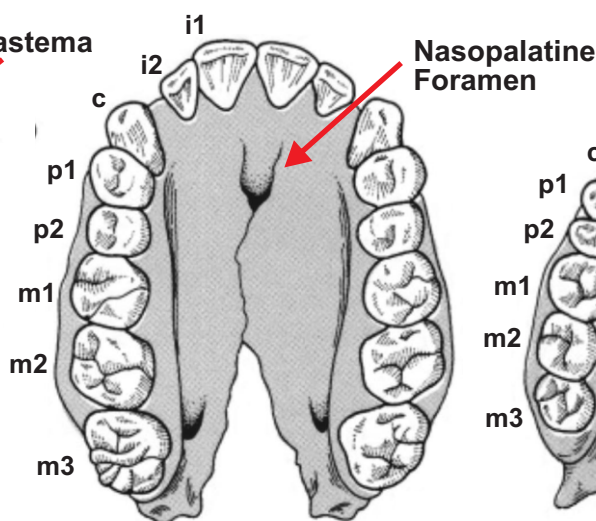


Human

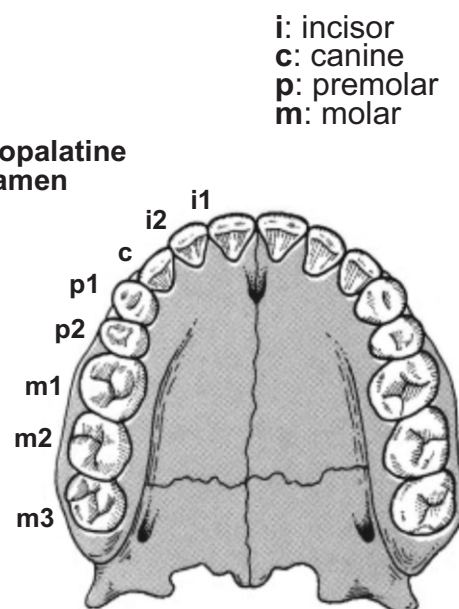
### Upper Jaw & Teeth



Chimpanzee



A. afarensis



Human

i: incisor  
c: canine  
p: premolar  
m: molar



# HOMININ EVOLUTION

## Australopithecus sediba

2 to 1.5 mya  
420-450 cc



## Homo habilis

2.4 to 1.4 mya  
500-650 cc



## Homo Egaster

1.8 mya to 600 kya  
600-910 cc



# HOMININ EVOLUTION

## Homo erectus

1.1 mya to 50 kya  
810-1250 cc



## Homo heidelbergensis

600 to 400 kya  
1250-1300 cc



## Homo neanderthalis

500 to 30 kya  
1125-1550 cc





# HOMININ EVOLUTION

**Homo sapiens**  
**ANATOMICALLY**  
**Modern Humans**

**200 to 50 kya**  
**900-2000 cc**  
**Average: 1350**



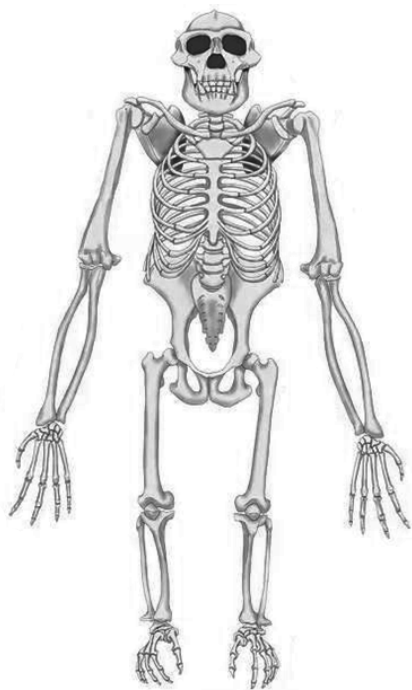
**Homo sapiens**  
**BEHAVIORALLY**  
**Modern Humans**

**50 kya to Today**  
**900-2000 cc**  
**Average: 1350**

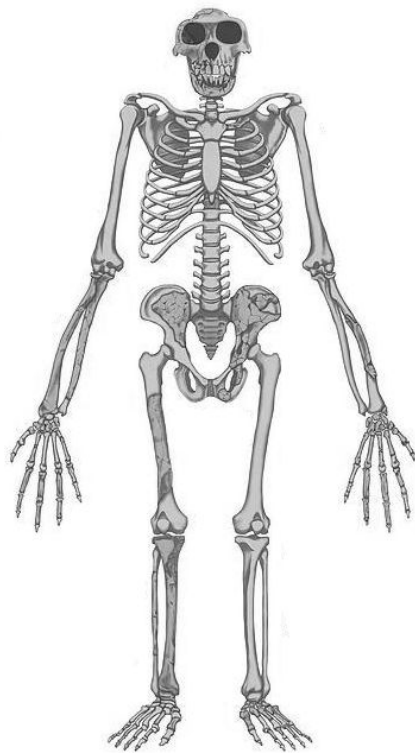


# ANATOMICAL COMPARISONS

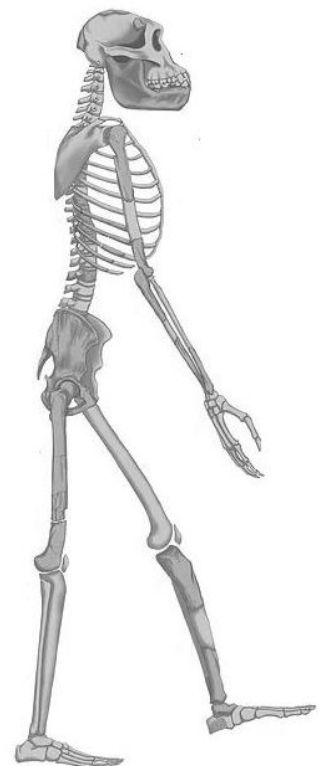
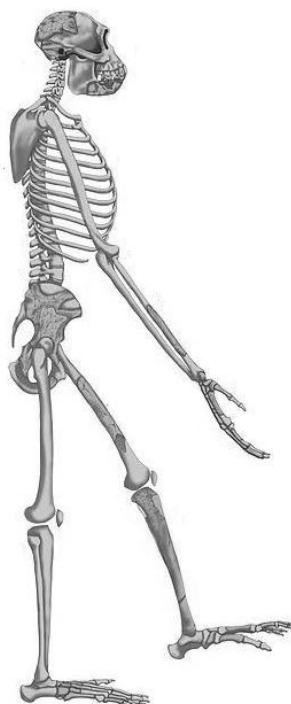
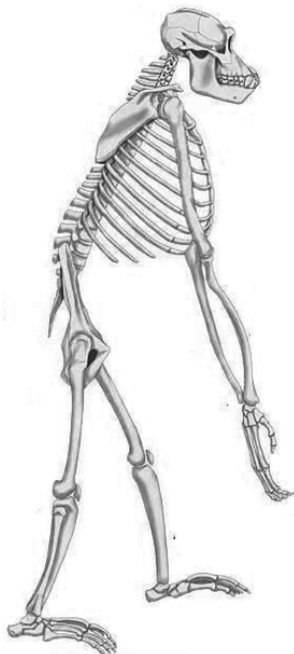
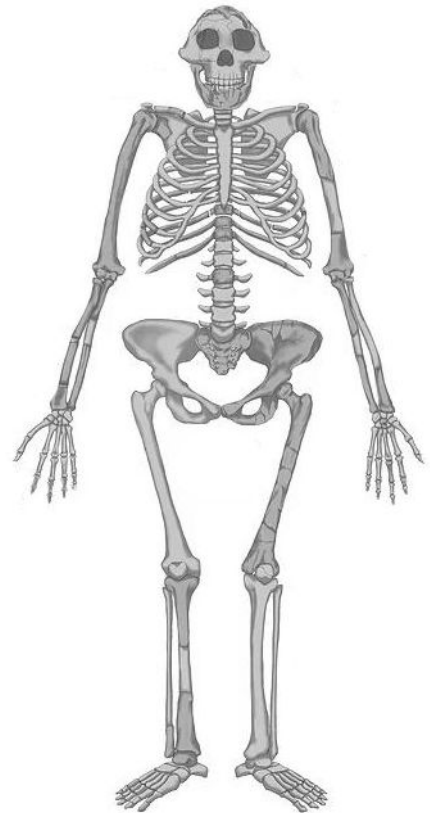
**Non-Hominin  
Chimpanzee**  
Today



**Ardipithecus  
ramidus**  
4.4 mya



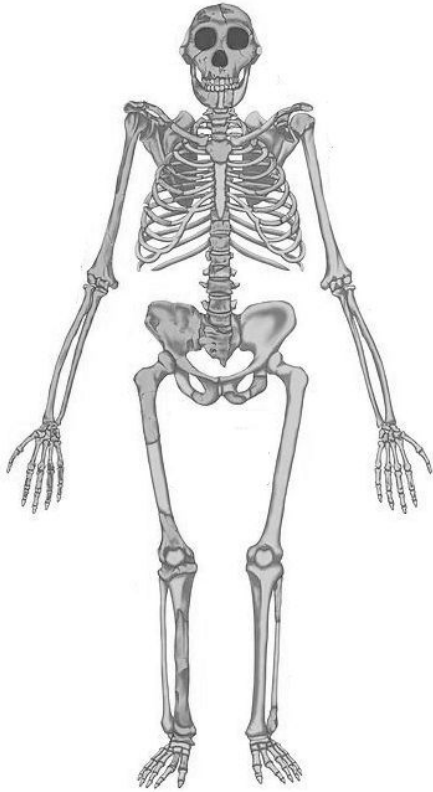
**Australopithecus  
afarensis**  
3.7 to 3.0 mya



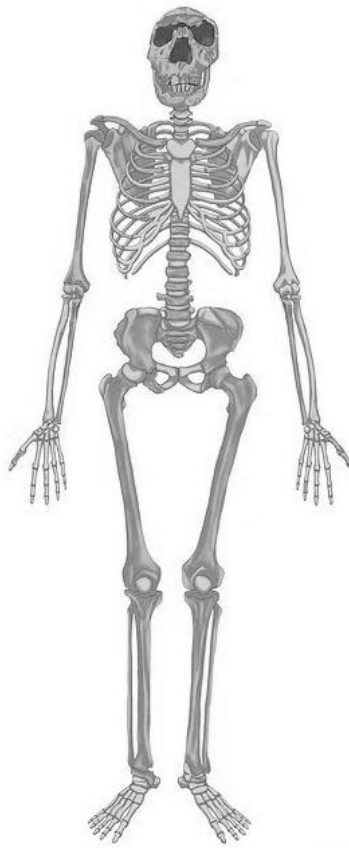


# ANATOMICAL COMPARISONS

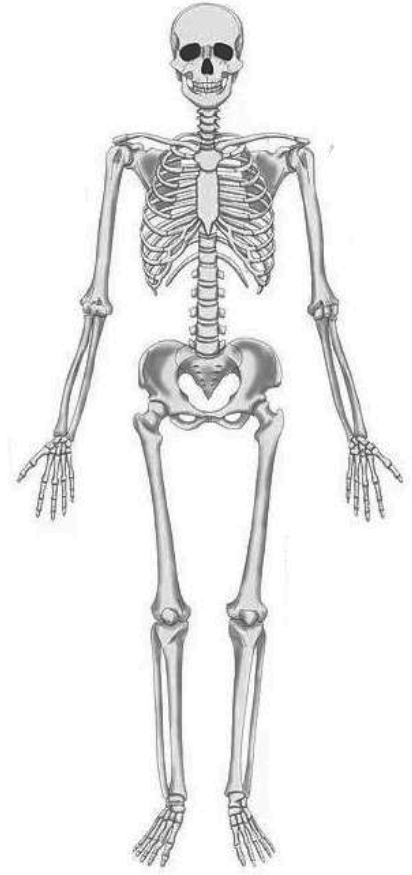
**Australopithecus  
sediba**  
2.0 to 1.5 mya



**Homo ergaster**  
1.8 mya to 600 kya

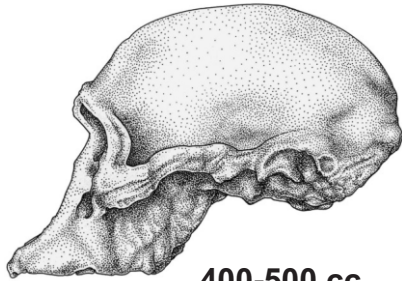


**Homo sapiens**  
Humans Today



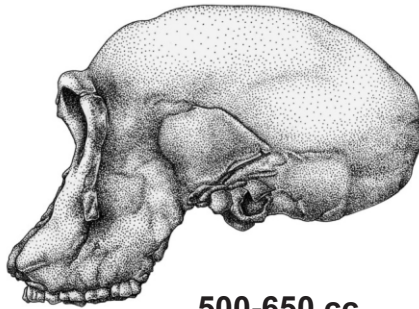
# CRANIAL VOLUME COMPARISONS

**Australopithecus africanus**



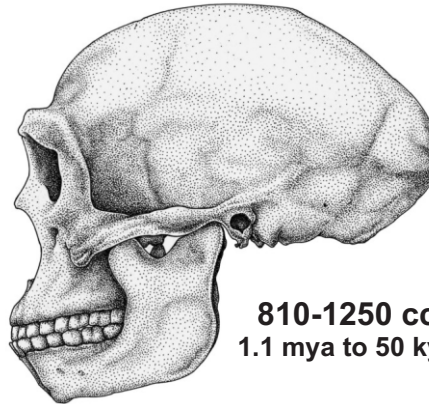
400-500 cc  
3.0 to 2.0 mya

**Homo habilis**



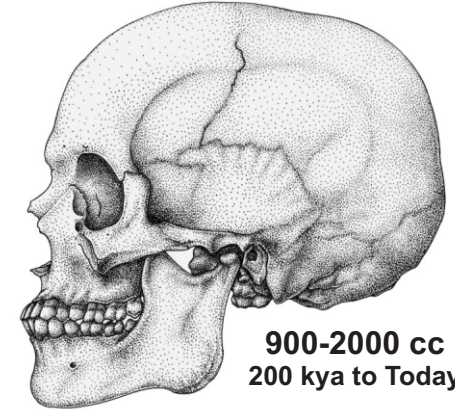
500-650 cc  
2.4 to 1.4 mya

**Homo erectus**



810-1250 cc  
1.1 mya to 50 kya

**Homo sapiens**



900-2000 cc  
200 kya to Today

©1994 D. J. Maizels

**Non-Hominin Chimpanzee**



370-380 cc  
Today

cc: cubic centimetres  
mya: millions of years ago  
kya: thousands of years ago

## Average Cranial Volume of Hominins

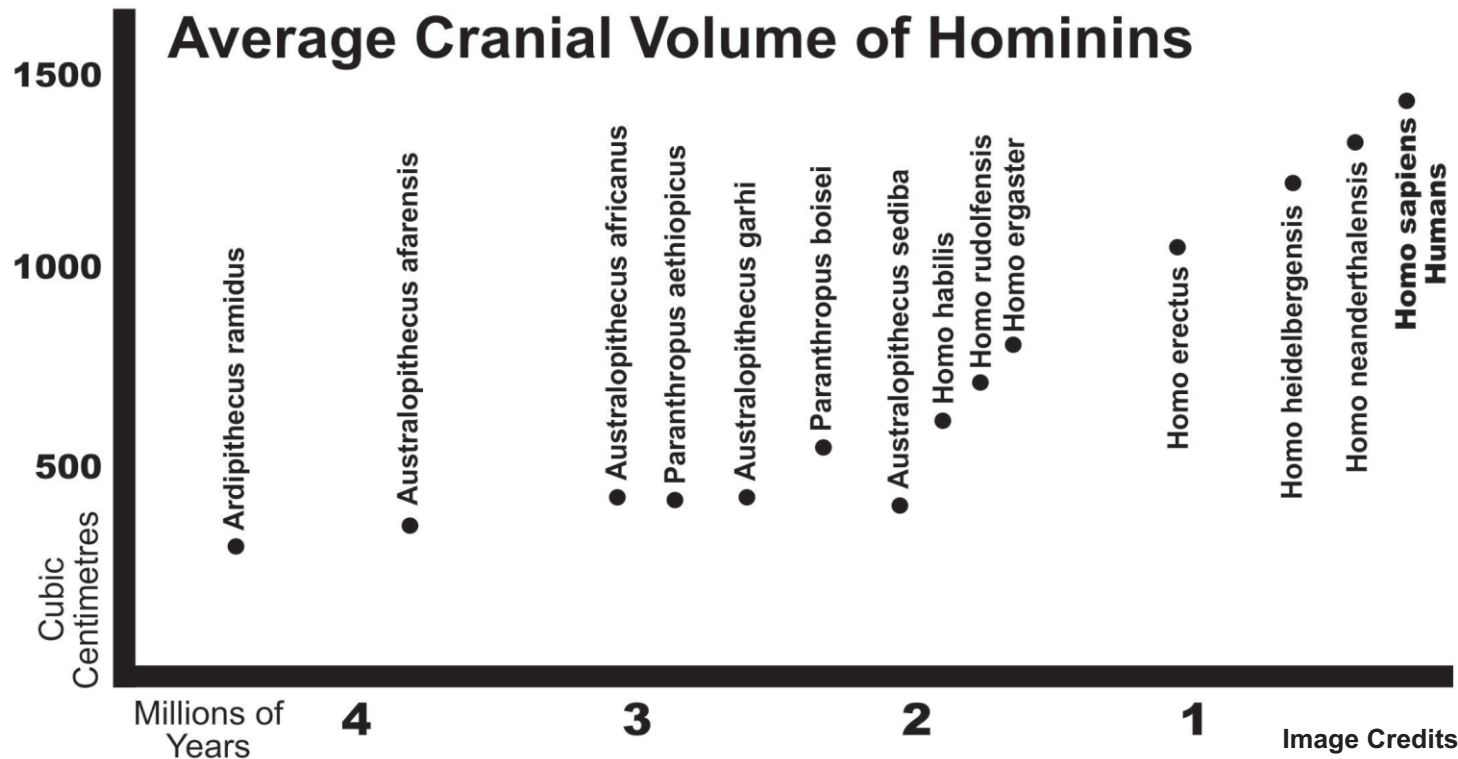
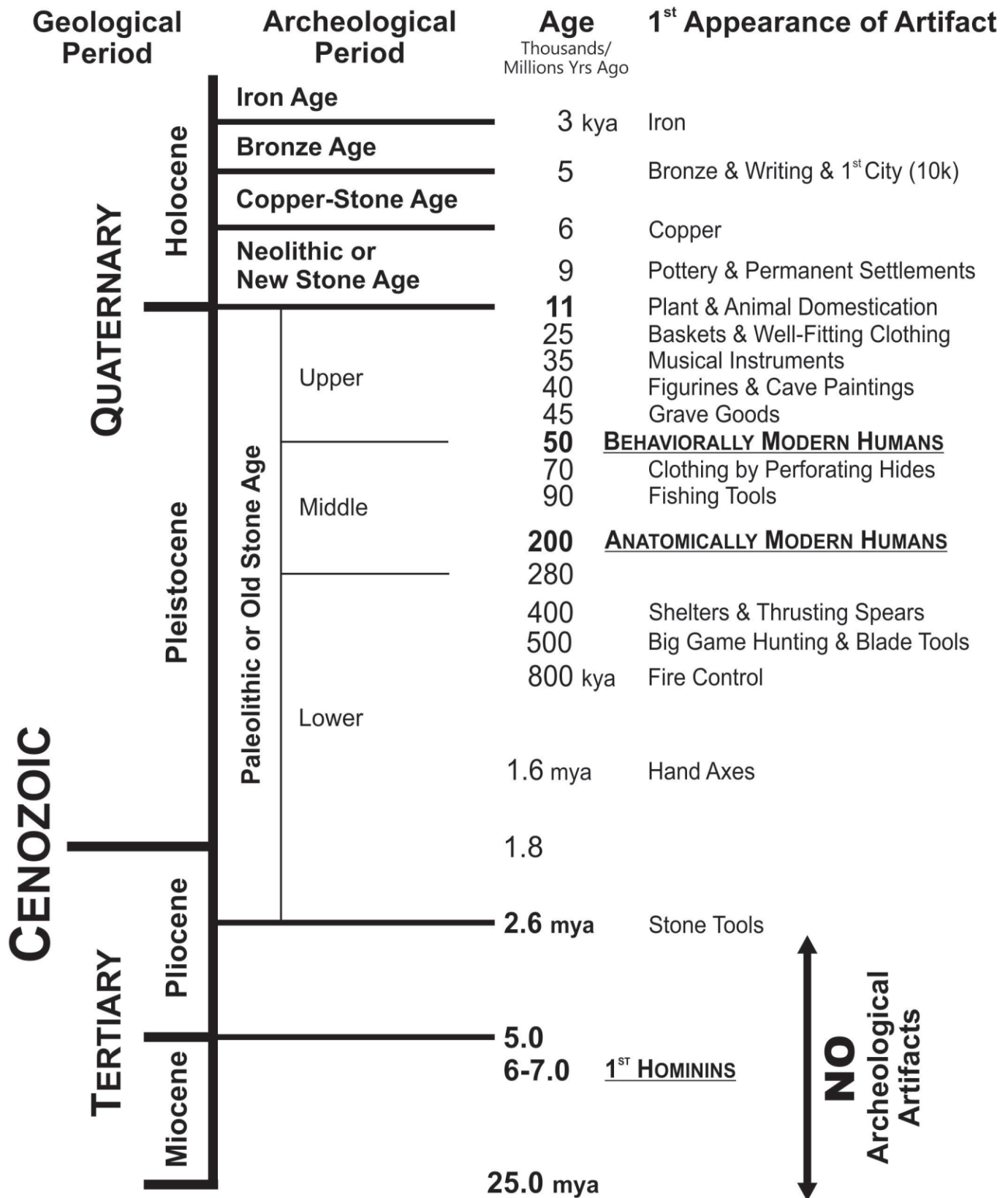


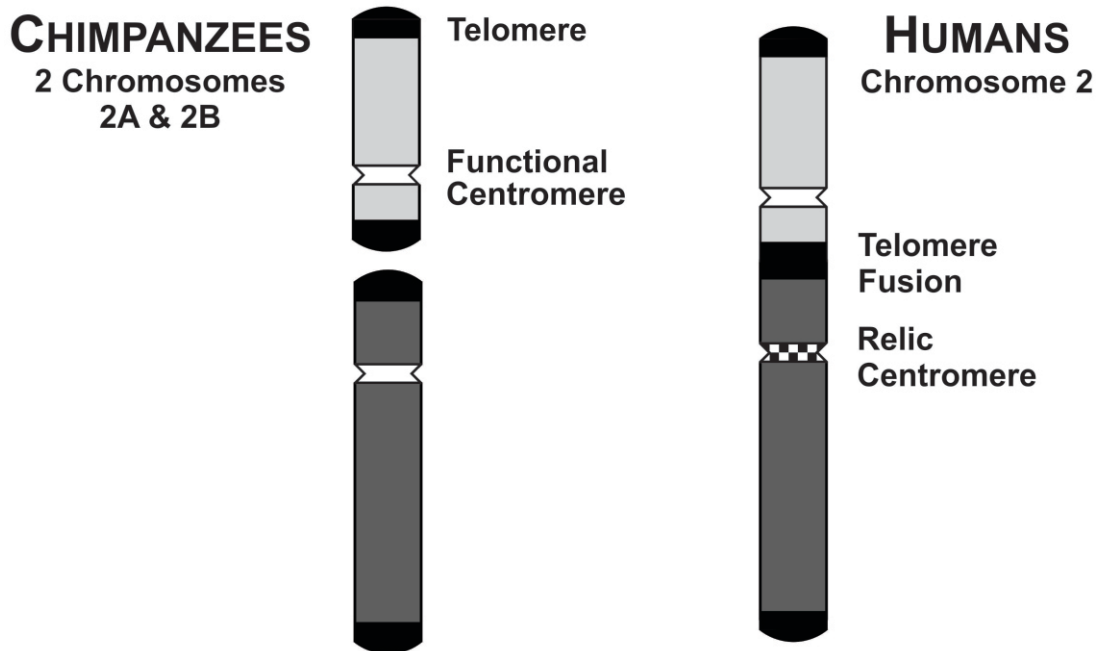
Image Credits p. 98

# ARCHEOLOGICAL DEVELOPMENT

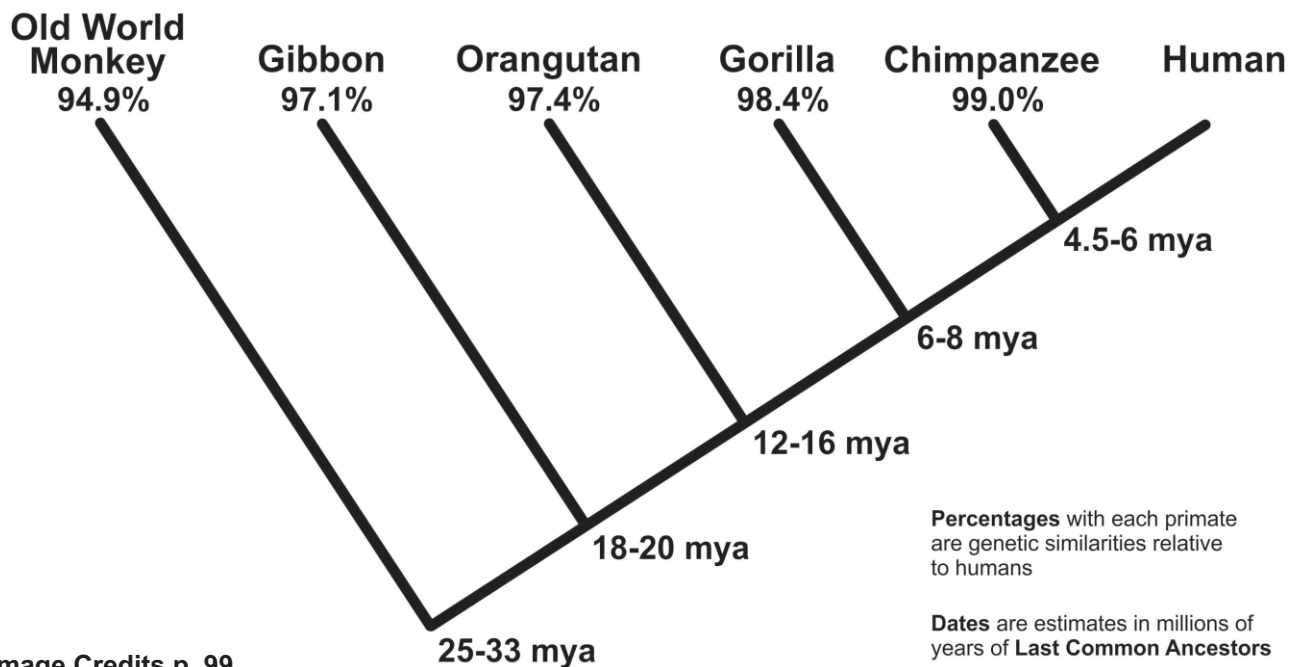


NOTE: Dates Not Drawn to Scale

# HUMAN CHROMOSOME 2 AND CHIMPANZEE CHROMOSOMES 2A & 2B

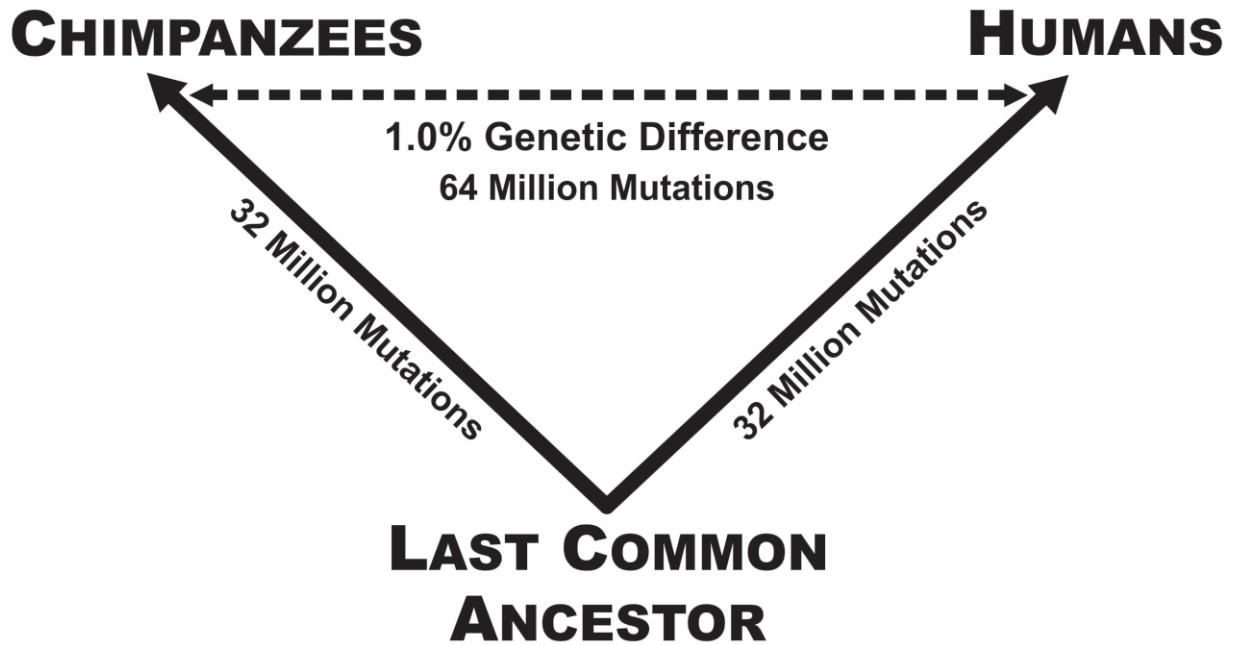


## Evolutionary Relatives Humans, Apes & Monkeys

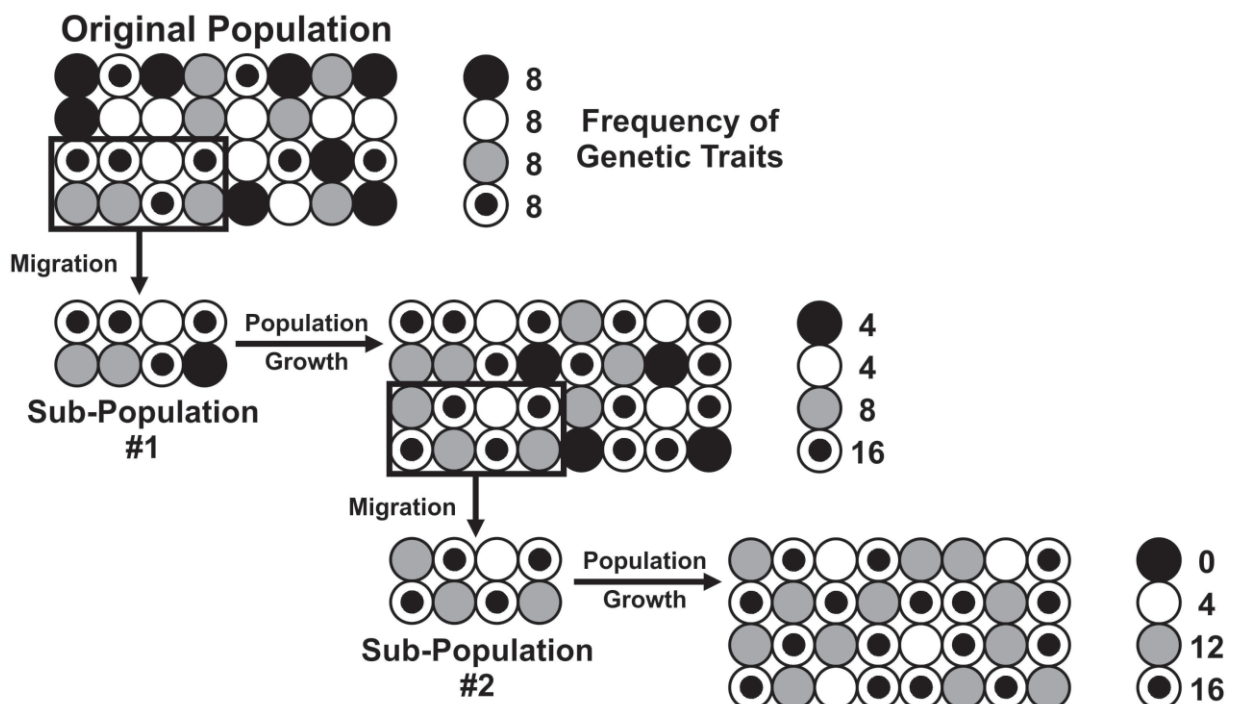




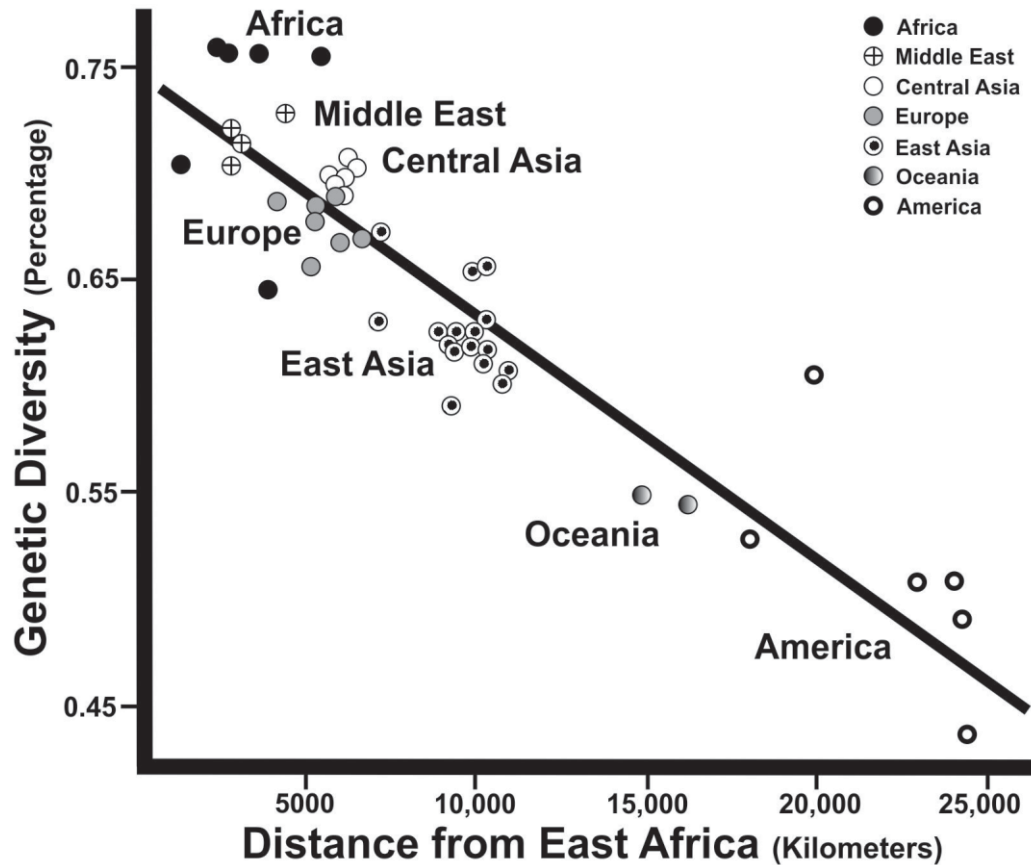
# ACCUMULATION OF MUTATIONS IN THE CHIMPANZEE & HUMAN EVOLUTIONARY LINES



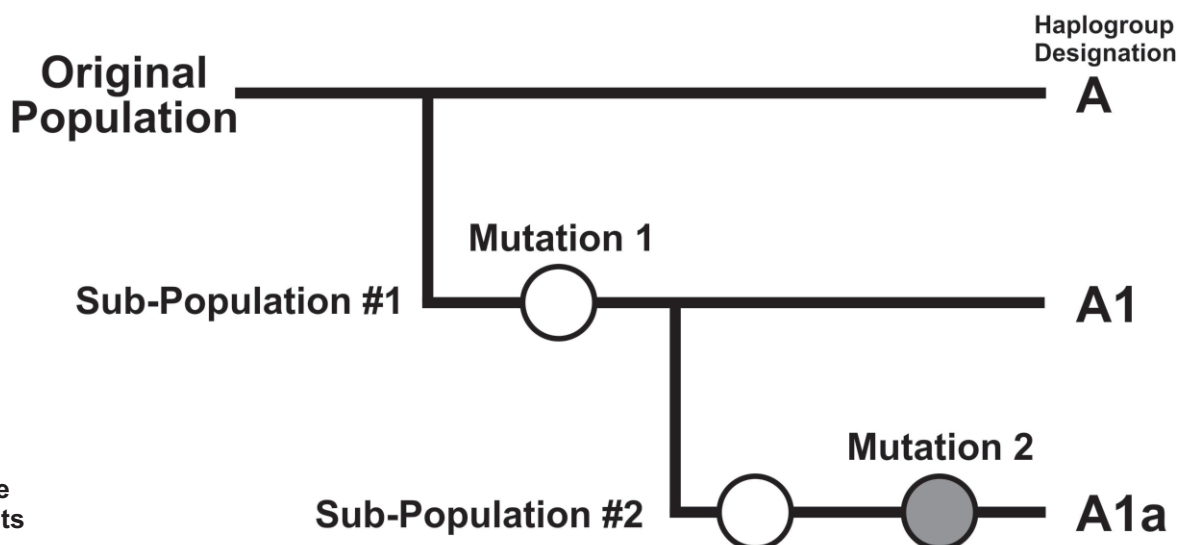
## REDUCTION IN GENETIC DIVERSITY & GEOGRAPHICAL MIGRATION



# GENETIC DIVERSITY IN HUMANS & GEOGRAPHICAL DISTANCE



## EMERGENCE OF HAPLOGROUPS IN MITOCHONDRIAL DNA & Y-CHROMOSOME DNA



# MITOCHONDRIAL DNA HAPLOGROUPS & THE MIGRATION OF HUMANS

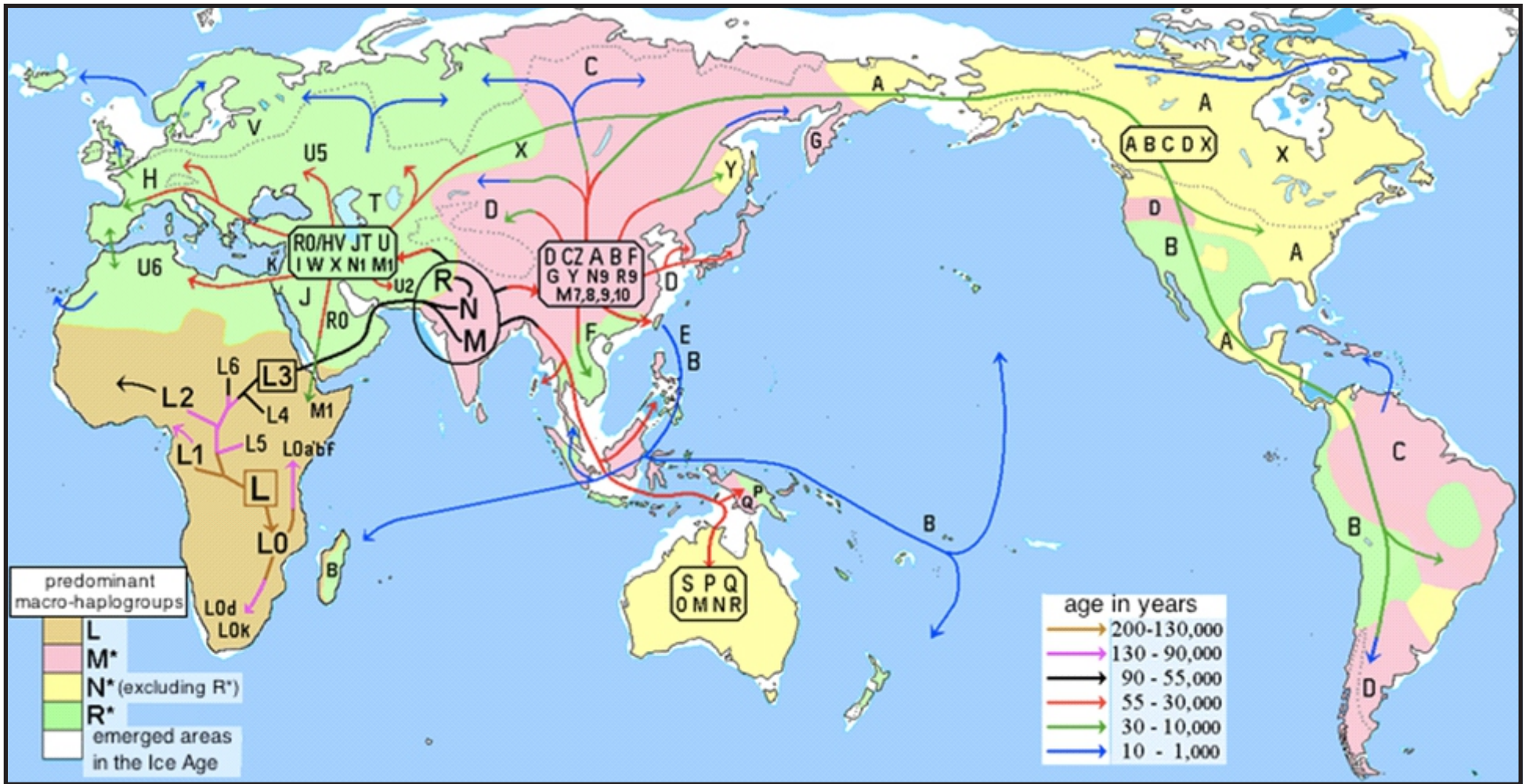


Image Credits p. 99



# Y-CHROMOSOME DNA HAPLOGROUPS & THE MIGRATION OF HUMANS

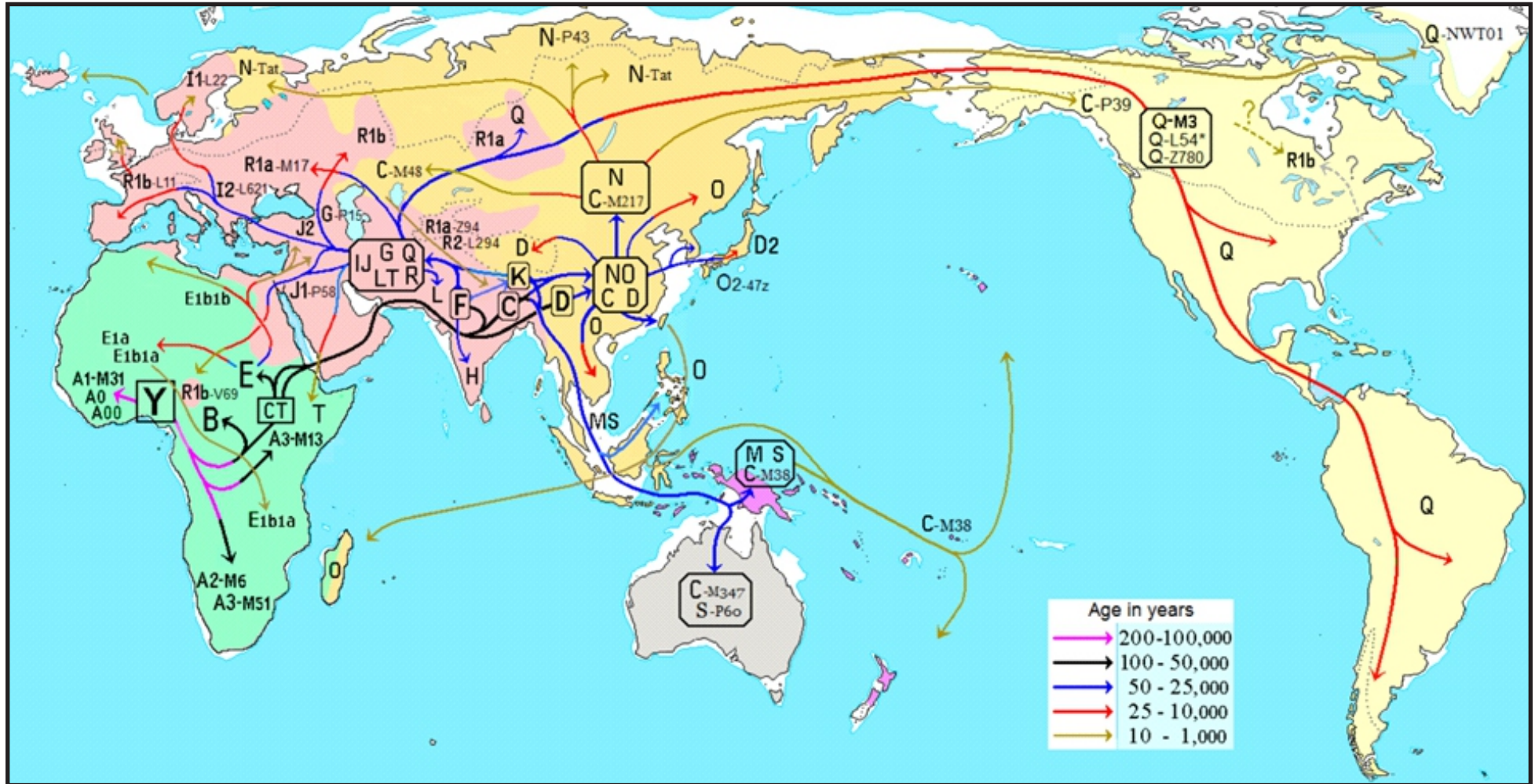
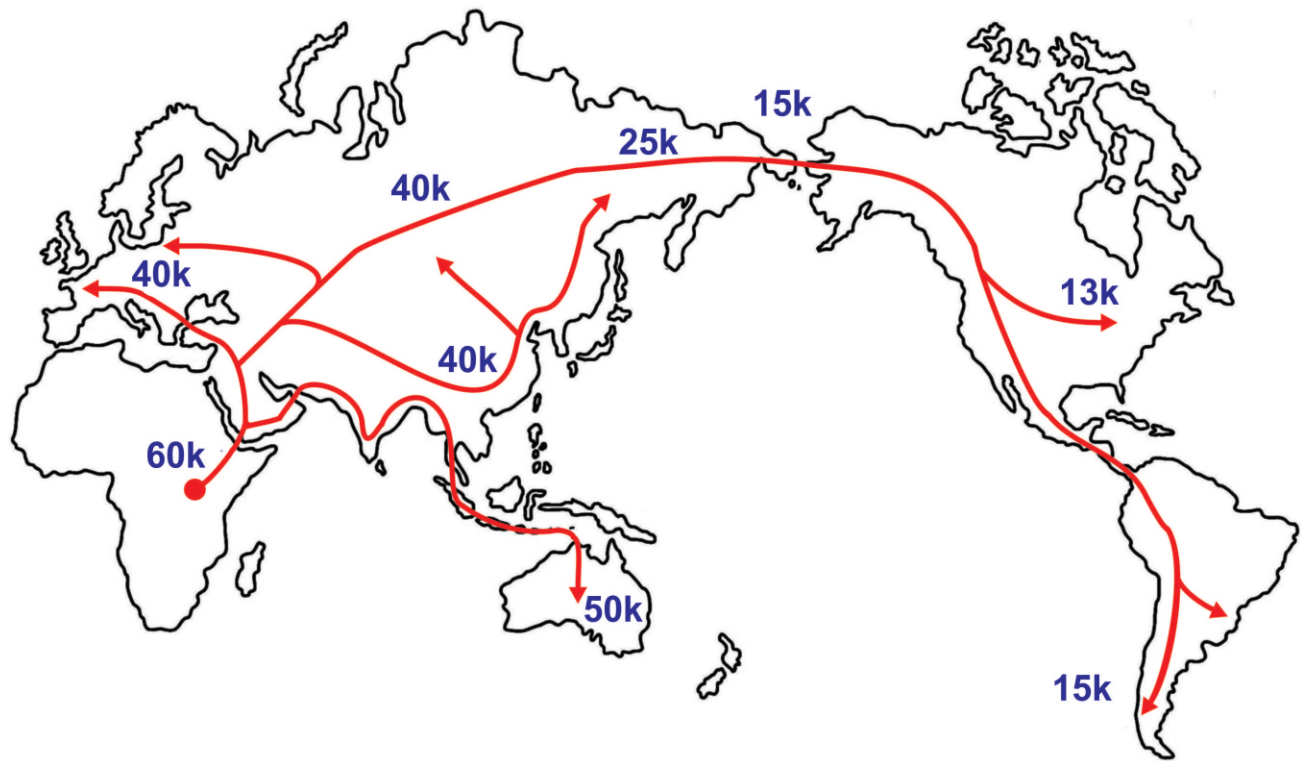


Image Credits p. 99

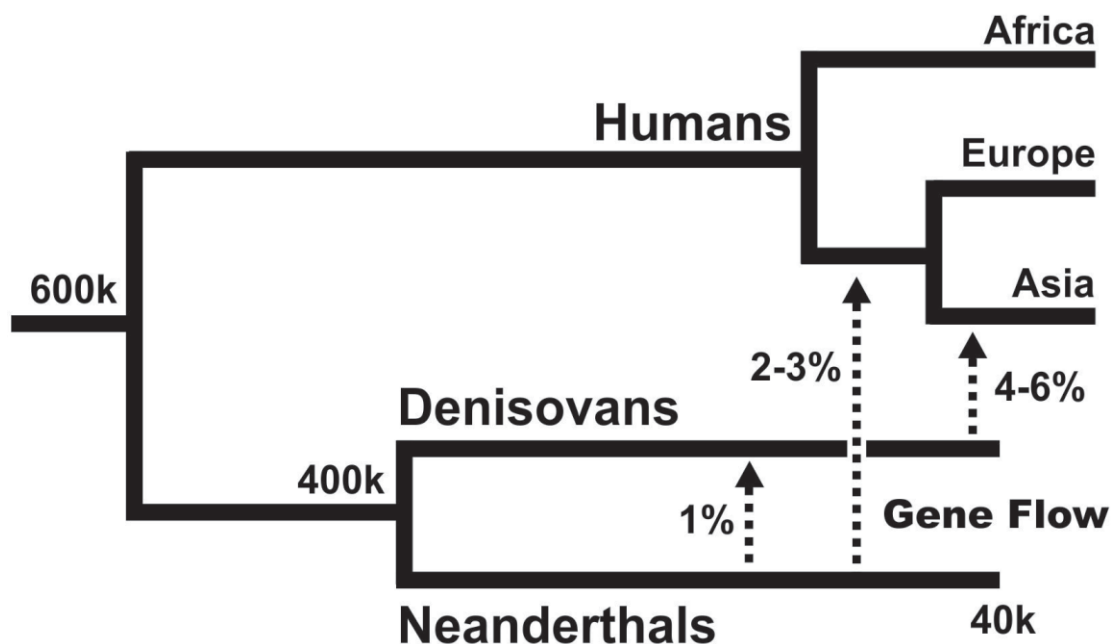


# THE OUT-OF-AFRICA THEORY

## ORIGIN & MIGRATION OF HUMANS



## INTER-BREEDING BETWEEN HUMANS, NEANDERTHALS & DENISOVANS

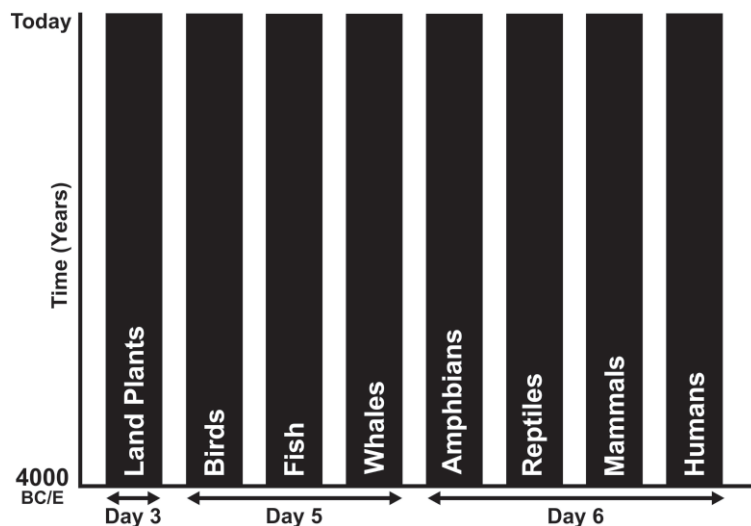


# CATEGORIES ON THE ORIGIN OF THE UNIVERSE & LIFE

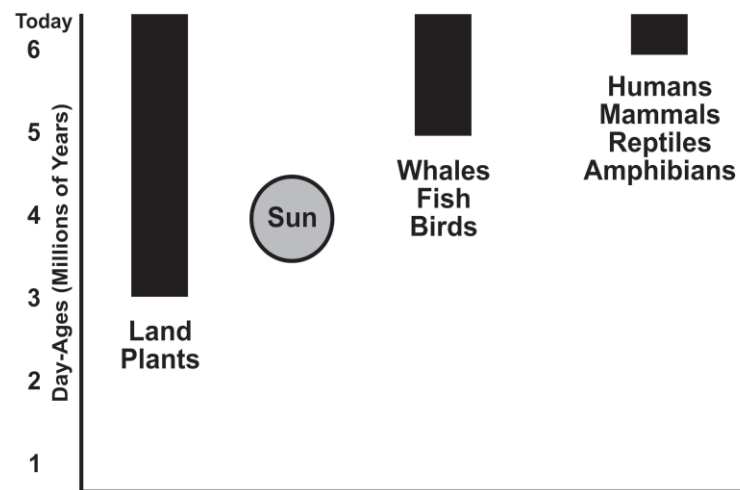
	YOUNG EARTH CREATION	PROGRESSIVE CREATION	EVOLUTIONARY CREATION	DEISTIC EVOLUTION	DYSTELEOLOGICAL EVOLUTION
Teleology	Yes	Yes	Yes	Yes	No Plan & purpose an illusion
Intelligent Design	Yes Points to a Designer	Yes Points to a Designer	Yes Points to a Designer	Yes Points to a Designer	No Design an illusion
Age of the Universe	Young 6000 yrs	Old 14 billion yrs	Old 14 billion yrs	Old 14 billion yrs	Old 14 billion yrs
Evolution of Life	No	No	Yes	Yes	Yes
God's Activity in the Origin of the Universe & Life	Yes Direct <b>God-of-the Gaps</b> interventions over 6 days	Yes 1. Direct for "kinds" of living organisms <b>God-of-the-Gaps</b> interventions over billions of yrs 2. Indirect for inanimate universe <i>Ordained &amp; Sustained natural processes</i>	Yes Indirect <b>Self-Assembly</b> thru <i>Ordained &amp; Sustained natural processes</i>	Yes Indirect <b>Self-Assembly</b> thru ordained natural processes God never enters the world	No No God <b>Self-Assembly</b> thru natural processes driven by blind chance
God's Activity in the Lives of Men & Women	Yes Personal God Dramatic & subtle	Yes Personal God Dramatic & subtle	Yes Personal God Dramatic & subtle	No Impersonal God God never enters the world	No No God
The Bible	Word of God	Word of God	Word of God	No divine revelation God never enters the world	No divine revelation No God
Genesis 1-3 Spiritual Correspondence Scientific Concordism	Yes Yes	Yes Yes	Yes No	No No	No No
Interpretation of Genesis 1-3	Strict literalism Creation days = 24 hr days	General literalism Creation days = millions of yrs	1. Spiritual Truths 2. Ancient science 3. Ancient story/allegory	Irrelevant myth	Irrelevant myth
Human Spirituality Image of God Sinfulness	Yes Yes	Yes Yes	Yes Yes	No No	No No
Human Evolution	No	No	Yes	Yes	Yes
Theology or Philosophy	Conservative Christianity	Conservative Christianity	Conservative Christianity	Deism	Atheism

# FOSSIL PATTERN PREDICTIONS OF CHRISTIAN VIEWS OF ORIGINS & THE FOSSIL RECORD

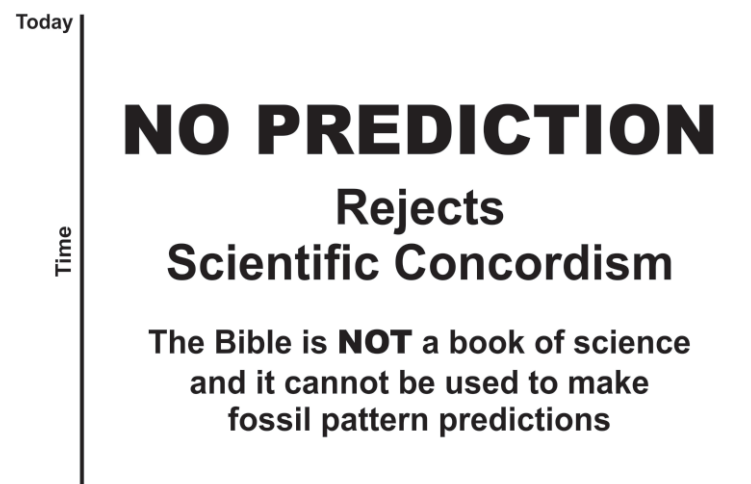
## Young Earth Creation



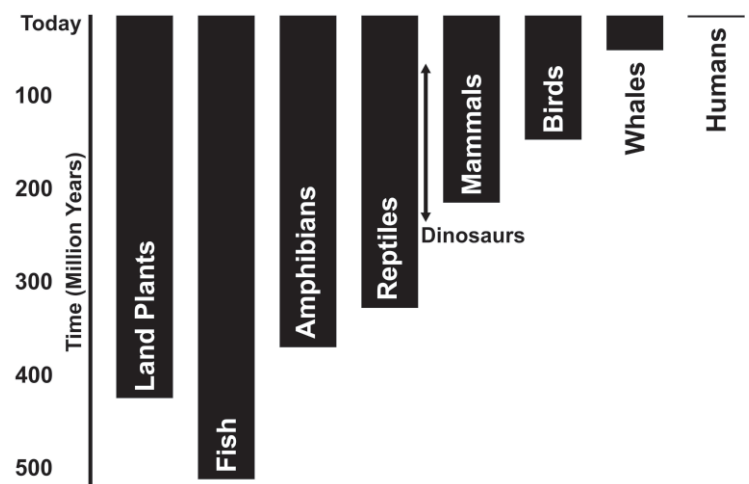
## Progressive Creation



## Evolutionary Creation



## The Fossil Record



# THE FAILURE OF CONCORDISM IN THE BIBLE

## The Heavens & the Earth

### Structures

	Reality
Firmament overhead in heaven & set on foundations	No
Sun, moon & stars placed in firmament	No
Sea of waters above in heaven held up by firmament	No
Beams of divine dwelling set in waters above	No
Flat circular earth with ends, foundations & underworld	No
Flat circumferential sea around earth & bordered by horizon	No

### Operations

Earth is immovable	No
Sun moves daily across sky	No
Sun, moon & stars move through firmament	No
Stars occasionally fall to earth	No

### Origins

<i>De Novo</i> creation of heavens	No
<i>De Novo</i> creation of firmament	No
<i>De Novo</i> creation of heavenly waters above	No
<i>De Novo</i> creation of sun, moon, stars & placement in firmament	No
Divine dwelling set in waters above	No
<i>De novo</i> creation of earth	No
<i>De novo</i> raising of earth out of waters below (seas)	No
<i>De novo</i> placement of waters below (seas) in one place	No

## The Living Organisms

### Structures

Mustard seed is the smallest seed	No
Bats are birds	No
Rabbits are ruminants (chew the cud)	No
Male reproductive seed contains a miniature person	No
Female does not have reproductive seed	No

### Operations

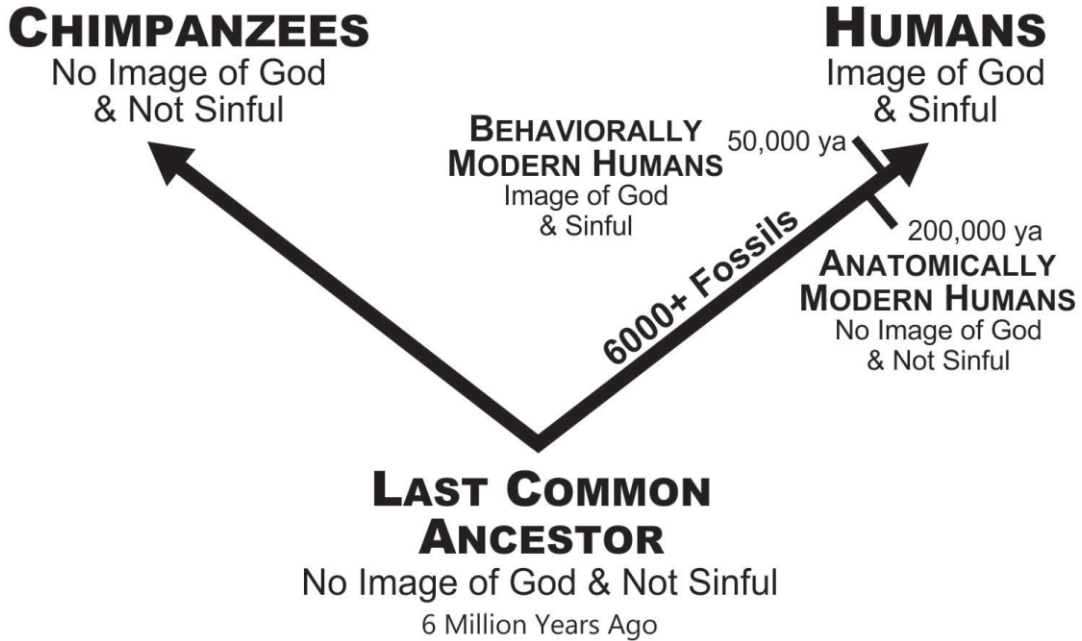
Seeds die before germination	No
Male seed takes root & develops in womb of female	No
Female alone causes reproductive problems	No
Plants are immutable (unchanging)	No
Animals are immutable (unchanging)	No
Humans are immutable (unchanging)	No

### Origins

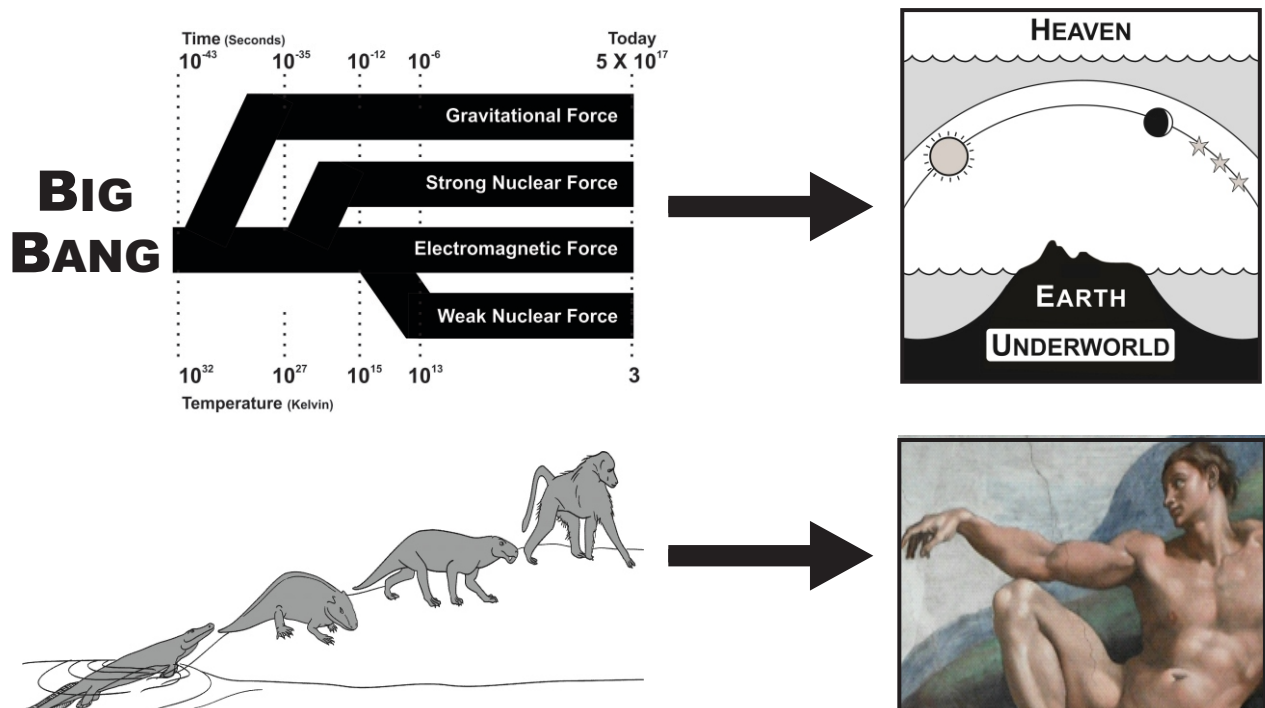
<i>De novo</i> creation of plants "according to their kind"	No
<i>De novo</i> creation of sea creatures "according to their kind"	No
<i>De novo</i> creation of birds "according to their kind"	No
<i>De novo</i> creation of land animals "according to their kind"	No
<i>De novo</i> creation of humans	No
<i>De novo</i> creation of a 1 <sup>st</sup> man (Adam) from dust	No
<i>De novo</i> creation of a 1 <sup>st</sup> woman (Eve) from side of man	No
Origin of suffering & death after creation of humans (Cosmic Fall)	No



# MANIFESTATION OF IMAGE OF GOD & SIN DURING HUMAN EVOLUTION



## COSMOLOGICAL EVOLUTION & BIOLOGICAL EVOLUTION ANALOGY



# HUMAN ORIGINS

## METAPHYSICS-PHYSICS PRINCIPLE

### METAPHYSICS

**God Created Humans**

Humans Are Ordained, Sustained  
& Intelligently Designed

Humans Have Image of God  
& Are Sinful



### PHYSICS

**Human Evolutionary Sciences**

Paleontology, Anthropology,  
Archeology & Genetics

# HUMAN ORIGINS

## MESSAGE-INCIDENT PRINCIPLE



# **TWO DIVINE BOOKS**

## **COMPLEMENTARY RELATIONSHIP**

### **WITHIN AN**

## **EVOLUTIONARY CREATION**

---

**BOOK OF GOD'S WORDS**  
 Spiritual Truths  
 INERRANT

*Intuition*  **FAITH**  *Reason*

**BOOK OF GOD'S WORKS**  
 Scientific Facts  
 Evolutionary Sciences  
 Cosmology, Geology & Biology

# Hermeneutical Principles

## 1. LITERALISM

### Hermeneutical Commandment #1

Thou shall not believe that the Bible is 100% literal!!!

"God will cover you with **his feathers** & under **his wings** you will find refuge."  
Is God a cosmic chicken?!? Ps 91:4

JESUS: "I say to you that anyone who looks at a woman with lust has already committed adultery with her in his heart. If your right eye causes you to sin, **tear it out and throw it away.**"  
Are churches filled with blind men?!? Matt 5:28-29

### COMMENTS

- it is impossible to read the Bible literally 100% of the time  
Jesus did NOT speak literally 100% of the time

JESUS: "Though I have been speaking **figuratively**, a time is coming when I will no longer use this **kind of language**, but will tell you **plainly** about my Father" ... Then Jesus' disciples said, "Now you are speaking **clearly** & without **figures of speech.**"  
John 16:25 & 29

**Parables of Jesus** → parables are stories with a spiritual lesson  
stories are NOT accounts of literal & actual events

- literal language in the Bible is NOT more important or holier than the non-literal language because Jesus used both

THE QUESTION:  
When do we read a biblical passage literally or non-literally?

### CONCLUSION

- everyone is forced to make a hermeneutical decision on whether or not a biblical passage is to be read literally.
- are you aware of your hermeneutical decisions?
- can you justify your hermeneutical decisions?

### GENESIS 1-3

Should we read Gen 1-3 literally? Why? Or why not?

## 2. LITERARY GENRE

DEF: the type of literature

EG poetry, narrative, parable, allegory, history, letters, proverbs, laws, sermons, hymns, prophecies, etc

NB: The Bible is like an ANTHOLOGY  
roughly **50 authors** & written over roughly **1500 years**

### Lust & Tearing Out Eyes Passage

found in the **Sermon on the Mount** (Matt 5:21-43)

what type of literature is this?

this literary unit has similar passages:

JESUS: "If your right hand causes you to sin, cut it off and throw it away."  
Are churches filled with handless Christians?!? Matt 5:30

JESUS: "Do not resist an evil person. If someone strikes you on the right cheek turn to him the other."  
Is this verse against protecting ourselves?!? Matt 5:38

### Features Hyperbole:

use exaggeration → this technique helps us to remember  
☛ do not interpret literally

### CONCLUSION

- literary genre DICTATES interpretation
- identification of the literary genre is one of the 1<sup>st</sup> & most important decisions in hermeneutics
- the challenge for us today is to identify ANCIENT LITERARY GENRES  
some genres will seem "unusual" because we do not use them today

### GENESIS 1-3

What is the literary genre of Gen 1-3?

EG Garden of Eden Account (Gen 2-3)

two mystical trees: one imparts eternal life

one imparts knowledge of good & evil

a talking snake

### Science? Allegory? Fairy Tale?



### 3. ACCOMMODATION

DEF: God descending to the level of humans in order to reveal himself revealing Spiritual Truths so that humans can understand them

**Most Important Hermeneutical Principle in Science & Religion**

#### The Mustard Seed

JESUS: "With what can we compare the *Kingdom of God*, or what parable will we use for it? It is like a mustard seed, which, when sown upon the ground, **is the smallest of all the seeds on the earth**; yet when it is sown it grows up & becomes the greatest of all shrubs." Mk 4:30-32 (NRSV)

- is the mustard seed "the smallest of all the seeds on the earth"? **NO**. Orchids are much smaller (one is the size of bacteria)

- DID JESUS MAKE A MISTAKE? **DID JESUS LIE?**  
**OR**

Was Jesus **accommodating** to his audience?

Was Jesus using the botany-of-the-day? **Ancient Botany?**

#### THE CONCERN

some Christians complain accommodation "waters down" the Bible

#### Arguments for Accommodation

- (1) Example of the **Incarnation** Latin *carnis*: flesh

DEF: God descended & became a human in the person of Jesus

- ☛ **GREATEST ACT OF ACCOMMODATION** → God became a man  
"In the beginning was **the Word**, and **the Word** was with God, and the **Word was God**. He was with God in the beginning. Through him all things were made; without him nothing was made that has been made ... **The Word became FLESH** and lived for a while among us." ohn 1:1-3, 14

- (2) Jesus's Use of Parables

DEF: earthly story with a heavenly meaning

Jesus used common ideas-of-the-day to teach spiritual truths

- (3) Personal Prayer

when God talks to you does he not accommodate and use:

YOUR language & YOUR categories?

- (4) Principle of Teaching

everyone does it when talking to a 4 yr old

### Message-Incident Principle



#### GENESIS 1-3

Did God **accommodate** when he inspired the ancient writers of the biblical creation accounts in Gen 1-3?

Did God allow them to use their **ancient understanding of origins?**

### 4. ANCIENT PHENOMENOLOGICAL PERSPECTIVE OF NATURE: THE 3-TIER UNIVERSE

DEF: nature as it **appears** to the naked eye & natural senses  
Greek *phainōmenon*: appearance

#### CATEGORIES OF PHENOMENOLOGICAL PERSPECTIVE

##### Ancient Phenomenological Perspective

what the ancients saw, they believed was LITERAL & ACTUAL:  
EG hard dome overhead & flat earth

☛ **NO telescopes!**

structure of heaven & earth was understood from the perspective of the naked eye & an ancient mindset

##### Modern Phenomenological Perspective

what we see, we know it is only an APPEARANCE:  
so-called "dome" of sky & so-called "flat" earth is a visual effect

**ANCIENT**  
Unaided  
Physical Senses  
Literal & Actual  
Dome of Heaven &  
Flat Earth

**MODERN**  
Aided by  
Scientific Instruments  
Appearance of  
"Dome" of Heaven &  
"Flat" Earth

**PHENOMENOLOGICAL PERSPECTIVES**

## 4A. THE EARTH & ANCIENT GEOGRAPHY

### 1. Earth Is Immovable

"The world is firmly established; it **cannot move**." Ps 93:1

### 2. Earth Set on Foundations

stated 20 X

"God set the earth on its **foundations**; it can never be moved."

Ps 104:5

### 3. Earth Surrounded by Circumferential Sea

LOGICAL notion → emerged because of two phenomena:

- visual impact of horizon
- travellers in Ancient Near East eventually came to a sea

#### Geography of the Ancient Near East

the "end" of the earth was at a shoreline:

W: Mediterranean Sea    N: Black & Caspian Seas

E: Persian Gulf        S: Arabian & Red Seas



#### Creation of Circumferential Sea

Job 26:7-14 Creation Account

"God inscribed a **circle** on the surface of the waters." v. 10

Proverbs 8:22-31 Creation Account

"God inscribed a **circle** on the surface of the deep." v. 27

REMEMBER Genesis 1:2 → water covers the earth  
God begins creating the world by outlining the outer  
boundary of the circumferential sea at the horizon

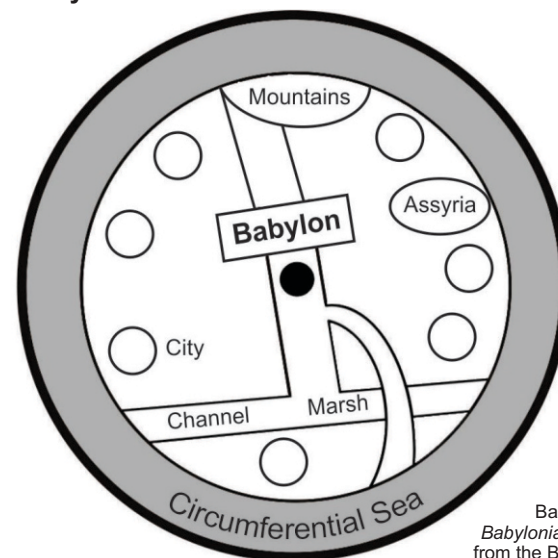
## Historical Criticism

DEF: the use of Ancient Near Eastern (eg Egypt & Mesopotamia) literature  
to understand the Bible within its historical context

EG circumferential sea was the geography-of-the-day 2500 yrs ago

### Babylonian World Map

6<sup>th</sup> Century BC/E



## 4. Earth Is Circular

"God sits enthroned above the **circle of the earth**." Is 40: 22

Christians often claim that this verse refers to the spherical outline  
of the earth from the perspective of outer space

it is used as PROOF that the Bible has modern science

#### Proof-Text "Hermeneutics"

DEF: **tearing** ONE verse out of its context & **manipulating** it to mean  
something never intended by the author.

EG sound-bite political reporting on TV

#### BUT READ THE ENTIRE VERSE!!!

"God sits enthroned above the circle of the earth, and its people  
are like grasshoppers. He stretches out the heavens like a canopy,  
and spreads them out like a tent to live in." Isa 40:22

a tent with a domed canopy & flat floor

☛ 3-tier universe

## 5. Earth Has Ends

S12

stated 50 X in Scripture  
“the ends of the earth”

JESUS: “The **Queen of the South [Sheba]** will rise at the judgment with this generation and condemn it; for she came from the **ends of the earth** to listen to Solomon’s wisdom.” Matt 12:42  
Sheba is in the SW corner of the Arabian Peninsula S14

## 6. Earth Has an Underworld

S15

OLD TESTAMENT: called *she’ōl* 65 X

God: “Though they **dig down** to the depths of ***she’ōl***, from there my hand will take them. Though they climb up to the heavens, from there I will bring them down.” Amos 9:2 S15

NEW TESTAMENT: called *hadēs* 20 X S17

JESUS: “And you Capernaum, will you be lifted up to heaven? No, you will go **down** to ***hadēs***.” Lk 10:15 S18

also called *katachthonios* S19

“At the name of Jesus every knee should bow, [1] in heaven and [2] on earth and [3] in the *katachthoniōn* Phil 2:10

*katachthoniōn* = underworld

*kata* = down *chthonios*= underworld

## 7. Earth Is Flat

S20

- **NO** passage in Scripture directly states: “The earth is flat.” earth does look “flat” from an elevated position

- Flat earth clearly IMPLIED in Scripture: S21  
“The devil took Jesus to a **very high mountain** and showed him **ALL the kingdoms of the world.**”

Matt 4:8

Can one see the Chinese or Indigenous people in America from a mountain in the Middle East? NO

☞ only makes sense if the world is flat

## Earth Dearth Argument

S22

IF Scientific Concordism were true,

IF God intended to reveal scientific facts ahead of time,

THEN it is reasonable to expect God to reveal the shape of the earth

EG, comparing the earth to an orange, ball, etc.

**BUT**

S23

**Greek** *gē* earth, land

250 X in New Testament

NEVER referred to as a sphere or ball

**Hebrew** *’eres* earth, land

S24

2500 X in Old Testament

NEVER referred to as a sphere or ball

## 4B. THE HEAVENS & ANCIENT ASTRONOMY

S1

### 1. Sun Moves across the Sky Daily

S2

“The sun **rises** & the sun sets, and **hurries** back to where it **rises**.”

Eccl 1:5

“The sun **rises** at one end of the heavens and makes its **circuit** to the other.” Ps 19:6 S3

### 2. The Firmament

S4-5

DEF: solid dome of heaven above the earth

#### 2<sup>nd</sup> Day of Creation

S6

“God said, “Let there be a **firmament** between the waters to separate the water from the water.” So God made a **firmament** and separated the water under the **firmament** from the water above the **firmament**. And it was so. God called the **firmament** ‘heavens.’ And there was evening, and there was morning—The Second Day.” Gen 1:6-8

☞ word “firmament” appears 5X

#### Psalm 19

S7

“The heavens declare the glory of God and the **firmament** proclaims the work of his hands.” Ps 19:1

## Ancient Languages

ancient science is deeply embedded in some ancient words

**Greek** *stereōma*  
firmament, solid dome of heaven  
*stereos*  
hard, firm

**Hebrew** *rāqīaʿ*  
firmament, solid dome of heaven  
*rāqaʿ*  
to flatten, hammer, stamp down

Context of pounding metals:  
“They hammered out [*rāqa*] thin sheets of gold.”  
Ex 39:3

Context of creating the heavens:  
“Can you join God in spreading out [*rāqa*] the skies,  
**hard** as a mirror of **cast bronze**?”  
Job 37:18

## Historical Criticism

the firmament was the astronomy-of-the-day 3000 yrs ago  
in both Egypt & Mesopotamia

## 3. The Heavenly Sea: The “Waters Above”

a logical notion since the sky is blue & rain falls from above

### 2<sup>nd</sup> Day of Creation

“God said, “Let there be a firmament between the waters to  
separate the water from the water.” So God made a firmament  
and separated the **water under** the firmament from the  
**water above** it. And it was so ... The Second Day. Gen 1:6-8

leads to the expressions “waters above” & “waters below”

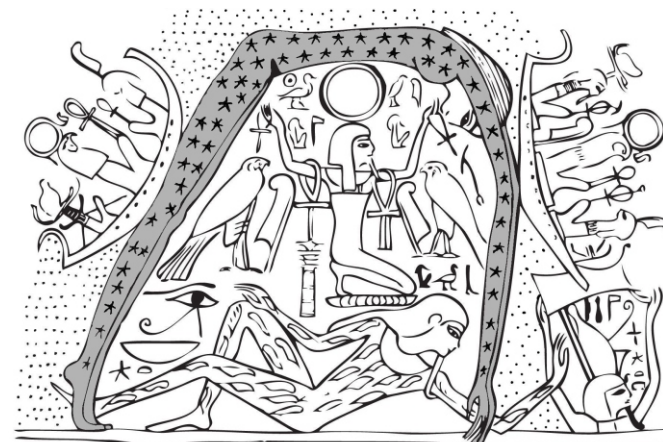
“Praise him [God], sun & moon, praise him, all you shining stars.  
Praise him, you highest heavens and you **waters above the skies**.”  
Ps 148:3-4

“God stretches out the heavens like a tent and lays **the beams**  
of his upper chambers **on their waters**.”  
Ps 104:2-3  
God’s dwelling set in the heavenly waters above

## Historical Criticism

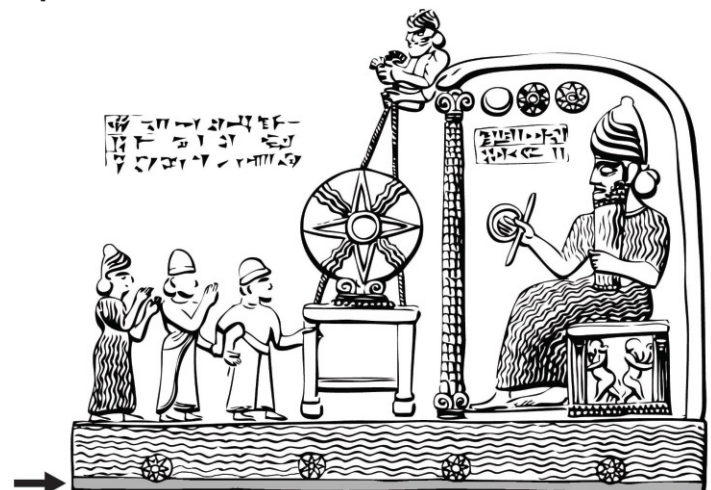
the heavenly sea was the astronomy-of-the-day roughly 3000 yrs  
ago in both Egypt & Mesopotamia

## Egyptian Universe 1570-1085 BC/E



The firmament (shaded) and stars are the sky goddess Nut. The sun god Re (falcon head) travels in a boat across the heavenly sea and is received by the afterlife god Osiris at the entrance of the underworld (lower right corner). The sun passes through the underworld to rise again in the east. Earth god Geb is reclined; air god Shu is above Geb.

## Mesopotamian Heavens 885-850 BC/E



The firmament (shaded; arrow) supports the heavenly sea (bracket) and stars. The sun god Shamash is seated.

Reproduced from O. Keel, *The Symbolism of the Biblical World*, T.J. Hallett, trans. (Winona Lake, IN: Eisenbrauns, 1997) 36, 174. Copied with permission.



#### 4. Ends & Foundations of the Heavens

S24

- “ends of the heavens” logical since end of firmament is at the horizon  
JESUS: “God will gather his elect from the four winds, from the ends of the earth to the **ends of the heavens**.” Mk 13:27

- “foundations of the heavens” logical notion because something was needed to support the firmament (like the foundations of the earth)  
 “The **foundations of the heavens** shook & trembled.” 2 Sam 22:8

#### 5. Sun, Moon & Stars Placed in the Firmament

S27

##### 4<sup>th</sup> Day of Creation

S28

“God said, ‘Let there be lights **in the firmament** of the heaven to separate the day from the night, and let them serve as signs to mark the seasons and days and years, let them be lights **in the firmament** of the heaven to give light on the earth.’ And it was so. God made two great lights—the greater light to govern the day and the lesser light to govern the night. He also made the stars. God set them **in the firmament** ... The Fourth Day.” Gen 1:14-19

logical idea since sun, moon, and stars appear to be embedded in the firmament in front of the heavenly sea S29

- stars were believed to be small and can fall to the earth S31-32  
 logical notion due to the phenomenon of meteors  
 same size & luminosity as stars & look like they fall from firmament

JESUS: “The **stars** will **fall** from heaven, and the heavenly bodies will be **shaken**.” Matt 24:29

#### 6. Upper Heavens

S33-34

##### GOD’S DWELLING PLACE

a real **PHYSICAL** location just overhead  
 A prayer to God:

“**Look down** from heaven, **your holy dwelling place**, and bless your people Israel.” Deut 26:15

#### 7. Lower Heavens

S35

##### FIRMAMENT

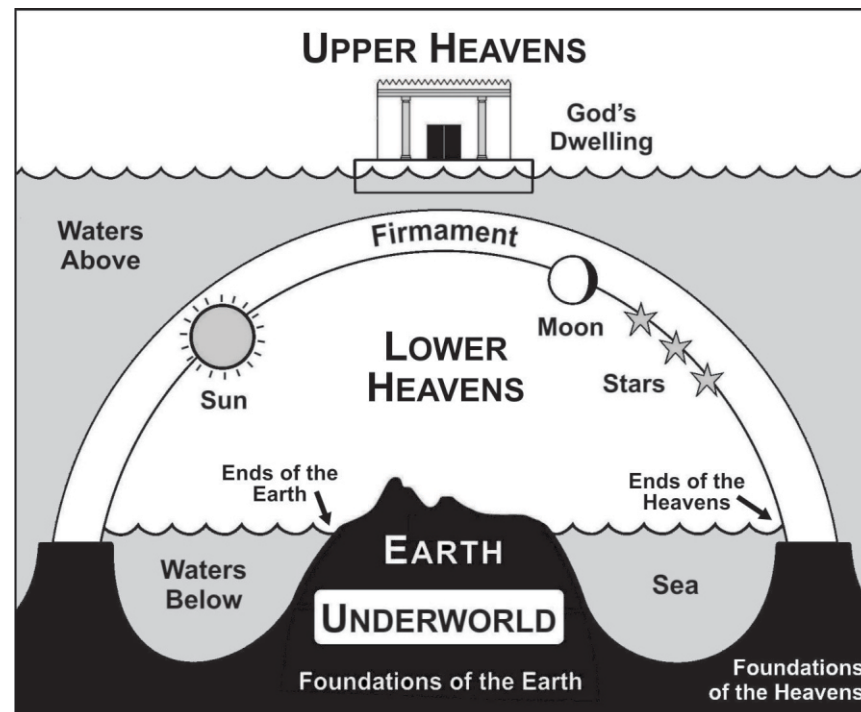
2<sup>nd</sup> Day of Creation: “God called the firmament ‘**heavens**.’” Gen 1:7

##### AIR SPACE

“God formed ... all the **birds of the heavens**.” Gen 2:19 S36-37  
 “The Son of Man coming in the **clouds of the heavens**.” Dan 7:13

## The 3-Tier Universe

S38



#### CONCLUSION

S39

- The Bible features a 3-Tier Universe  
 BEST science-of-the-day in the Ancient Near East (ANE)
- The Bible has an **Ancient Phenomenological Perspective** of the **structure** and **operation** of the universe
- God accommodated in the Bible and allowed the ancient writers to use **ancient astronomy** and **ancient geography** S40

#### QUESTION

S41

Does the Bible also feature an **ancient biology**?

#### GENESIS 1-3

S42

#### QUESTION

Do the creation accounts in Gen 1-3 feature an **ancient understanding** of the origin of the universe & life?

## 5. ATTRIBUTION OF DIVINE ACTION IN ORIGINS: DE NOVO CREATION OF THE 3-TIER UNIVERSE

**De Novo Creation** Latin *de*: from *novus*: new  
DEF: creation that is 'brand new' from the start  
found in most ancient creation accounts (eg, in the ANE)  
Features:  
QUICK: within days  
NOT over 100s of millions of years  
COMPLETE: into fully mature forms  
NOT through an evolutionary process  
☛ KEY concept to understand anti-evolutionism

**Attribution of Divine Action in Origins**  
DEF: God's creative action is filtered/accommodated through an ANE understanding of origins:  
**DE NOVO CREATION** → Quick & Complete

QUESTION 1:  
Does the Bible reveal the ACTUAL structure of the universe?

ANSWER 1: **NO**  
The Bible features a 3-tier universe

QUESTION 2:  
Does Gen 1 reveal how God ACTUALLY created the universe?

ANSWER 2: **NO**  
2<sup>nd</sup> Day of Creation:  
God creates the firmament & waters above **DE NOVO**  
3<sup>rd</sup> Day of Creation:  
God puts the seas in one place & raises dry land **DE NOVO**  
4<sup>th</sup> Day of Creation:  
God sets the sun, moon & stars in the firmament **DE NOVO**

QUESTION 3:  
Did God LIE in the Bible?

ANSWER 3: **NO!!!**  
God ACCOMMODATED  
God allowed the use of ancient astronomy & ancient geography as a vessel to deliver inerrant Spiritual Truths

## GENESIS 1-3 S11

IF the Bible has an ancient astronomy & an ancient geography,  
**THEN** it is reasonable that the Bible also has an **ancient biology**

IF we do not go to Gen 1 to find out how the heavens & the earth were created, S12  
**THEN** we should not go to Gen 1 to find out how **living organisms** were created.

☛ how **HUMANS** were created S13  
**THEREFORE** if we want to understand how God created the world: S14

## Open the Book of God's Works and Do the Science!

1<sup>st</sup> Half of Course

2<sup>nd</sup> Half of Course

## 6. ANCIENT PHENOMENOLOGICAL PERSPECTIVE OF NATURE: LIVING ORGANISMS & ANCIENT BIOLOGY S1

DEF: living organisms as they **appear** to the naked eye & natural senses S2  
an ancient understanding of plants & animals → **Ancient Biology**

### 1. Ancient Botany S3 Mustard Seed Is the Smallest of All Seeds

JESUS: "With what can we compare the *Kingdom of God*, or what parable will we use for it? It is like a mustard seed, which, when sown upon the ground, **is the smallest of all the seeds on the earth.**" Mk 4:30-31 (NRSV)

mustard seeds are not the smallest seeds on earth  
**BUT**  
from an Ancient Phenomenological Perspective  
they appear to be the smallest

### Seeds Die before Germination S4

JESUS: "The hour has come for the Son of Man [ie Jesus] to be glorified. I tell you the truth, unless a **kernel of wheat** falls to the ground and **dies**, it remains only a single seed. But if it **dies**, it produces many seeds." John 12:23-24

Do seeds die before they germinate?

**NO.** If they died, they would not germinate  
seeds are alive & function metabolically at  
a very low rate

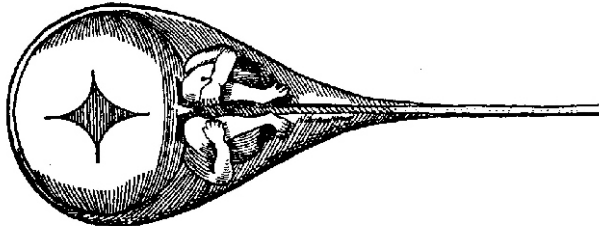
BUT

from an Ancient Phenomenological Perspective,  
the outer casing of the seed breaks down & rots  
giving the impression that the seed has died

## 2. Ancient Reproductive Biology

### Only Men Have “Seed” & Women Do Not

- ancient people did not have modern scientific instruments & did not know that men provide sperm & women provide eggs
- they assumed that the male provided a “seed” with an entire miniature person inside it  
known as **“Preformatism”** or **“1-Seed Theory”**  
a scientific theory up to 1700:



- in order to understand human reproduction, ancient people used the concepts & terminology of agriculture (farming)  
males provided “seed” similar to a plant  
females provided a “fertile field” for the seed to grow
- Hebrew noun *zera’* (1) seed farmers plant in fields  
(2) seed males provide during sex  
“flow of seed [*zera’*]” = ejaculation of semen  
Lev 15:32
- Hebrew verb *zāra’* (1) to sow seed in fields  
(2) to be made pregnant  
“a woman shall be seeded [*zāra’*] with seed [*zera’*]”  
Num 5:28

S5

Do only men have & provide “seed” during sex & women do not? S11

**NO.** Men provide sperm & women eggs

BUT

from an Ancient Phenomenological Perspective,  
men ejaculate & women do not, giving the impression  
that only men have & provide “seed” during sex

### Only Women Are the Cause of Reproductive Problems & Never Men

S12

- ancient people thinking about human reproduction through their agricultural concepts & terminology, thought that women were like fields in farming
- they assumed that when there was a reproductive problem that the woman was the cause & that she was like a **barren field** that did not produce crops

S6

- The Bible states that only women are barren: S13  
“Now Sarai was **barren**; she had no child.” Gen 11:30  
“But they had no children, because Elizabeth was **barren**.” Lk 1:7

S7

- Hebrew adjective *‘āqār* (1) barren field S14  
(2) barren woman
- Hebrew verb *‘āqar* means “to uproot” S15  
“a time to plant and a time to **uproot** [*‘āqar*]” Eccl 3:2

QUESTION: Why was a barren woman seen as “uprooted”? S16

- ancient people would have experienced **miscarriages**  
they would have seen small partially developed fetuses

S8

from an Ancient Phenomenological Perspective:  
it looked like a “seedling” **UPROOTED** from the womb

- Greek adjective *steiros* (1) barren field S17  
(2) barren woman  
root is *stereos* & means “hard”

S9

QUESTION: Why was a barren woman seen as “hard”? S18

- ancient people would have experienced that seed thrown  
on hard ground did not germinate & take root

S10

from an Ancient Phenomenological Perspective,  
the man was ejaculating “seed,” but it was not  
germinating & taking root in the woman’s **hard** “field”  
(her womb)

Are women the only cause of reproductive problems? S19

**NO.** Modern science reveals problems with:  
35% male, 35% female, 20% both, 10% unknown

BUT

from an Ancient Phenomenological Perspective,  
to think women were the cause made perfect sense,  
because a **barren** woman had either a seedling  
**uprooted** from the womb or a womb that was **hard**  
and did not allow the seed to germinate & grow

### 3. Ancient Taxonomy (Classification of Living Organisms) S20

#### Bats Are Birds

"These are the **birds** you are not to eat ... the eagle, the vulture,  
[17 other birds listed] ... and the **bat**." Lev 11:13-19

bats are not birds, they are mammals

BUT

from an Ancient Phenomenological Perspective,  
it is reasonable to think they were birds because bats fly

#### Rabbits Are Ruminants

"The rabbit, though it chews the cud, does not have a divided hoof;  
it is unclean for you." Lev 11:6

rabbits are not ruminants like cows that chew the cud

BUT

from an Ancient Phenomenological Perspective,  
the repetitive side-to-side jaw actions of rabbits  
gave impression that they chew the cud like cows

#### Living Organisms Are Immutable (Unchangeable) S22

- ancient people assumed that plants & animals never changed  
into other different plants & animals

BUT

from an Ancient Phenomenological Perspective,  
this made perfect sense

EG

they saw a goat births → a goat which births → a goat

- immutability of living organisms appears in Gen 1 S23  
plants & animals are created & reproduce:

#### "According to Their Kind"

this phrase appears 10X in Gen 1

3<sup>rd</sup> Day of Creation: Land Plants S24

"God said, 'Let the land produce vegetation: seed-bearing plants  
and trees on the land that bear fruit with seed in it, **according to**  
**their various kinds**.'" Gen 1:12

5<sup>th</sup> Day of Creation: Sea Creatures & Birds S25

"God created the great creatures of the sea and every living and  
moving thing with which the water teems, **according to their**  
**kinds**, and every winged bird **according to its kind**." Gen 1:21

6<sup>th</sup> Day of Creation: Land Animals S26

"God said, 'Let the land produce living creatures **according to**  
**their kinds**: the livestock, the creatures that move along the  
ground, and the wild animals, each **according to its kind**.'" Gen 1:24

### GENESIS 1-3 S27

#### QUESTIONS:

**IF** the Bible views living organisms from an Ancient Phenomenological  
Perspective,

**THEN** does the Bible also view the ORIGIN of plants & animals  
from an Ancient Phenomenological Perspective?

**IF** Gen 1 views living organisms as IMMUTABLE (unchangeable), S28

**THEN** what does this mean for the creation of plants & animals?

## 7. ATTRIBUTION OF DIVINE ACTION IN ORIGINS: S1

### THE *DE NOVO* CREATION OF LIVING ORGANISMS

When thinking about origins, we need to think like an ancient person S2

#### OBSERVATION S3

in his/her life time an ancient person saw:

a goat births → a goat which births → a goat

the parents of that ancient person saw:

a goat births → a goat which births → a goat

the grandparents of that ancient person saw:

a goat births → a goat which births → a goat

**NB** the "goat births a goat" series is a data set, like any today



## CONCLUSION 1

from their ancient phenomenological perspective, this ancient person, his/her parents, and his/her grandparents came to the very reasonable conclusion that goats are **immutable & never change**

## THE QUESTION

ancient people, like us today, naturally asked the question:  
Where do goats come from?

## THE ANSWER

ancient people would reasonably have thought:

... ← an even earlier goat ← an earlier goat ← a goat today

## CONCLUSION 2

ancient people assumed living organisms were immutable (unchangeable) and they reasonably concluded that God had created a first goat or a first group of goats

Creation of 1<sup>st</sup> goat/s ← ... ← an even earlier goat ← an earlier goat ← a goat today

**RETROJECTION** Latin *retro*: backward; *jacere* to cast, throw  
DEF: to cast back in time

EG crime scene investigation (CSI)  
police take evidence **present** at the scene, and  
cast it back in time to reconstruct the **past**

to understand the origin of goats, the ancient person **RETROJECTS** the “goat births a goat” data sets back in time to the creation of goats

## CONCLUSION 3

from their ancient phenomenological perspective, ancient people reasonably concluded the 1<sup>st</sup> goat/s were created **DE NOVO** (QUICK & COMPLETE)

☞ ancient people did not: have the fossil record  
know about evolution

## THE KEY: Connect Immutability & De Novo Creation

- Attribution of Divine Action in the Origin of Living Organisms connects:
  - (1) **Ancient Taxonomy** that plants & animals are immutable
  - (2) **Retrojection** of the observation that living organisms give birth only to their kind, back in time, to the *De Novo* creation of plants & animals

- God's creative action is filtered/accommodated through an ANE understanding of origins: S11

**DE NOVO CREATION** → Quick & Complete Creation of Plants & Animals S12

- God ACCOMMODATED in the biblical creation accounts (Gen 1 & Gen 2)

God allowed the use of **Ancient Biology**

☞ an incidental vessel to deliver the inerrant Spiritual Truth:

**God is the Creator of plants & animals**

## GENESIS 1-3

### QUESTIONS:

Young Earth Creation & Progressive Creation reject biological evolution because Gen 1 & Gen 2 state God created plants & animals **DE NOVO**  
BUT

Is anti-evolutionism (YEC & PC) ultimately based on:

**Ancient Biology**

**Ancient Taxonomy?**

Humans are created **DE NOVO** in Gen 1 & Gen 2

BUT

**DE NOVO** creation is an ancient understanding of origins.

Does this mean that the Bible **does not** reveal how God actually created men & women?

## 8. HISTORICAL CRITICISM

DEF: the use of Ancient Near Eastern literature (eg Egypt & Mesopotamia) in order to understand the Bible within its historical context

### Ancient Reproductive Biology

Aeschylus (5<sup>th</sup> Century BC/E)

“The mother of what is called her child is no parent of it, but the nurse only of the young life that is **sown** in her. The parent is the male, and she but a stranger, a friend, who, if fate spares his **plant**, preserves it till it puts forth.” *Eumenides* (v. 658-661)

### COMMENTS

- agricultural language → 1-seed theory (preformationism)
- similar language in the Bible with human reproduction:  
“Mary ... blessed is the **fruit of your womb** [Jesus]”

Lk 1:42

## Ancient Mesopotamian Creation Account S5

called “*Creation of the World by Marduk*” & dated 3000-2000 BC/E

All the lands were sea . . . S6

**Marduk** [main Creator] constructed a raft on the waters;

he created dirt and piled it on the raft.

**In order to settle the gods in the dwelling pleasing to them,** S7

he created mankind.

Aruru [goddess of child birth] created the **seed of mankind with him.**

He [Marduk] created the wild animals and all the animals of the steppe. S8-9

He created the **Tigris** & the **Euphrates** and set them in place, (cf Gen 2:14)  
giving them a favorable name.

He created the grass, the rush of the marsh, the reed, and the woods; S10

he created the green herb of the field,

the lands, marshes, and canebrakes,

the cow and her young, the calf, the ewe and her lamb,

the sheep of the fold; the orchards and forests.

### COMMENTS

- Marduk created the earth & living organisms **DE NOVO** S11-12

- Marduk created a Flat Earth → placed it on a raft  
earth surrounded by water

- Goddess Aruru created the “Seed of Mankind” in man S13  
1-seed theory (preformatism)

- humans are created to serve the gods → slaves of the gods

### G.E. Ladd’s Aphorism S14-15

“*The Bible is the Word of God given in the words of men in history*”

Message-Incident Principle

Message = “Word of God”

Incident = “words of men in history”

*New Testament & Criticism*  
(Eerdmans, 1967) 12

### GENESIS 1-3 S16

QUESTION:

After you read the “*Creation of the World by Marduk*,” did you think  
that the accounts in Gen 1 & Gen 2 are:

**The Word of God given in the words of men in history?**

inerrant Messages & an incidental ancient science of origins?

☛ **DE NOVO** creation of the universe, plants & animals?

## 9. SCOPE OF COGNITIVE COMPETENCE S1

### Telescopes & Microscopes Hermeneutical Principle S2

DEF: intellectual tools thru which everyone sees & understands the world

a feature of **BOTH**: (1) Biblical Writers &  
(2) Modern Readers of the Bible

### Scope S3

visual metaphor → “field” of vision

implies limits & boundaries

### Cognitive Latin *cognitō*: to learn & acquire knowledge S4

Cognition

DEF: mental processes in perceiving, reasoning & knowing  
cognition is impacted by:

intelligence & knowledge

culture, education & point in history

### ☛ Scientific Instruments

### Competence S5

being capable or having ability to perform correctly

Biblical Writers → **NARROW SCC**

limited field of vision: the naked eye

no telescopes & no microscopes

NB: no disrespect to ancient people

if we lived at that time, we would have the same views

Modern Readers → **WIDE SCC** S6

we see deeper into space & inside cells

we enjoy telescopes & microscopes

### GENESIS 1-3 S7

#### AGE OF THE UNIVERSE

**YOUNG** → **NARROW SCC**

**NO** instruments for radiometric dating

Based on the length of time in a few short genealogies

1<sup>st</sup> communities **ORAL**

reflects limits of memory before invention of writing (3000 BC/E)

#### CREATION OF LIVING ORGANISMS S8

**DE NOVO** → **NARROW SCC**

**NO** fossil record & **NO** instruments for genetic mapping

Based on the retrojection of the immutability of plants & animals

### Excursus: The “Hermeneutical Brakes”

Were the biblical writers COMPETENT to know:

- structure of the universe? **X**
- size of mustard seeds compared to all other seeds? **X**
- cause of human reproductive problems? **X**

**OR** were the biblical writers COMPETENT to know:

- Jesus had changed water to wine (John 2:9)? **✓**
- Jesus had healed a man who was born blind (John 9:6-7)? **✓**
- Jesus had risen to life after he had died on the Cross (Lk 24:36-53)? **✓**

QUESTION:

Which group of questions are FOUNDATIONAL to Christianity?

## 10. SUFFICIENCY OF THE BIBLE & PROFICIENCY OF ITS READERS

DEF: despite challenges of hermeneutics, the Message of Faith is revealed to those seeking to meet God

- Sufficiency → the Bible is sufficient in revealing God
- Proficiency → readers are proficient in grasping main Messages

**NB:** there is a spiritual aspect to hermeneutics:

- “those seeking to meet God” & wanting a personal relationship with him
  - ☛ not just intellectual
  - it is a mystical & spiritual encounter
  - hearing the “**Voice of God**” in Scripture

### Lesson from Church History

The MESSAGE has always got through to the Church  
eg, Jesus died on the Cross & rose from the dead

The INCIDENTAL elements, these have led to a wide variety of views  
eg, origin of the world in Gen 1 → YEC, PC, EC etc

### GENESIS 1-3

Is Gen 1-3 sufficient & are readers proficient? **YES! & YES!**

Christians through history have always grasped 5 main MESSAGES:

1. God created the universe & life
2. The universe & life are very good
3. Humans are created in the Image of God
4. Humans are sinful
5. God judges humans for their sins

## 11. THE BACONIAN HERMENEUTIC

DEF: the use of science in biblical interpretation

everyone already does this whether or not they are aware of it

EG no one reads passages of the sun “moving” as being literal

WHY? we all accept modern astronomy

“Our Saviour [Jesus] says, ‘*You err, not knowing the scriptures, nor the power of God*’ [Matt 22:29], laying before us **two books or volumes** to

study, if we will be secured from error; [1] first the **Scriptures**, revealing

the will of God, and then [2] the **creatures** expressing his power; whereof

**the latter is a KEY unto the former**: not only opening our understanding

to conceive the **true sense of the Scriptures** ... but chiefly opening our

belief, in drawing us into a due meditation of the omnipotency of God,

which is chiefly **signed and engraven** upon his works.”

Sir Francis Bacon *Advancement of Learning* (1605) 1.6.16

### COMMENTS

- **Creatures** (creation) HELP to find the “true sense” of the **Scriptures**

modern science is a **KEY**:

- (1) in identifying the ancient science in the Bible
  - (2) in separating the Message from the ancient science
- helps avoid the CONFLATION of the two together

- Two Types of Divine Revelation → **Two Divine Books**

SPECIAL REVELATION: The Bible

Scriptures reveal “the will of God”

GENERAL REVELATION: Natural Revelation & Intelligent Design

Creatures reveal “the omnipotency of God signed and engraven upon his works”

### GENESIS 1-3

- will the **evolutionary sciences** assist Christians in finding the “true sense” of the biblical creation accounts in Gen 1-3?

- are Jesus’ words in Matt 22:29 applicable today to:

Scientific Concordists

“You are in error because you do not know the Scriptures.”

☛ the Bible has an ancient science & concordism **FAILS**

Anti-Evolutionists

“You are in error because you do not know the power of God.”

☛ God has the **overwhelming** to create the universe & life

thru evolution & allow the world to **SELF-ASSEMBLE**

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