

Bukti-bukti

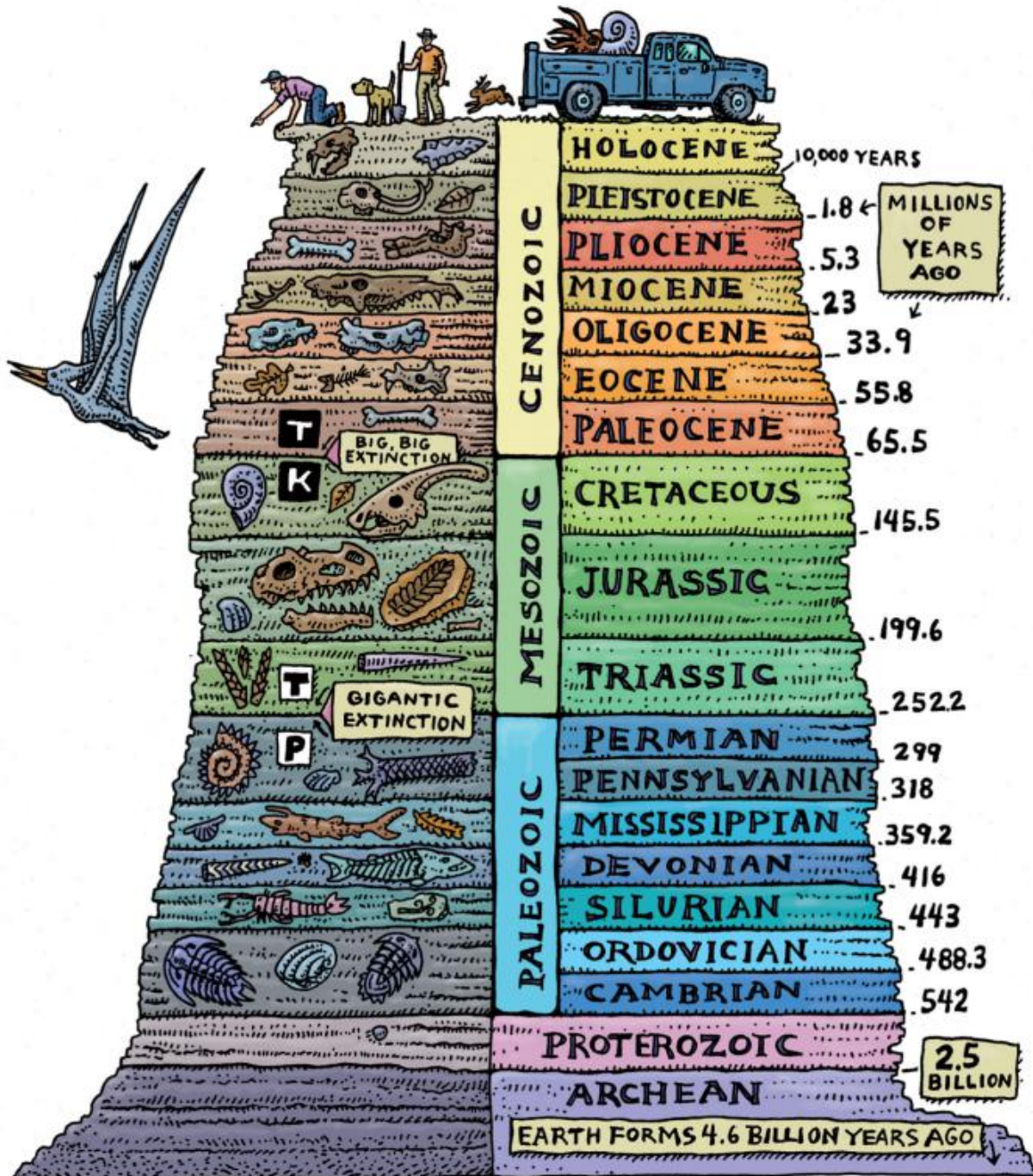
Evolusi

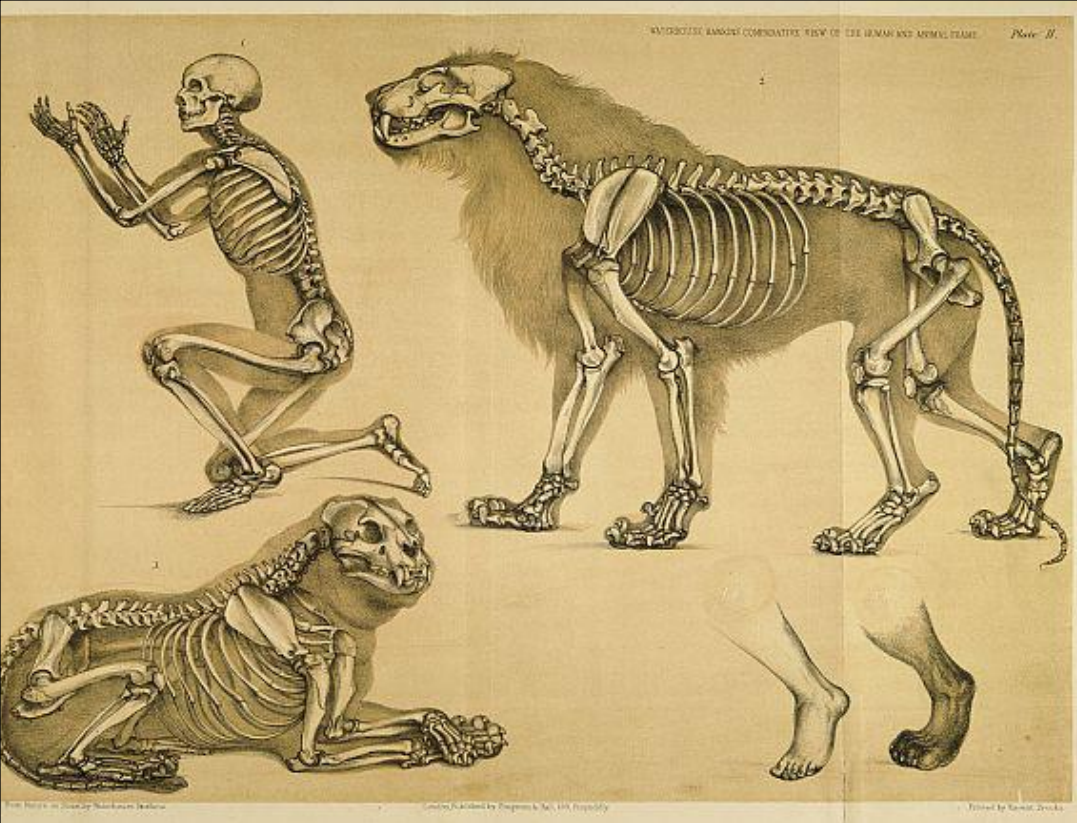
Kerjakan Sekarang

Bagaimana Fosil dapat menjadi bukti evolusi?

hari ini kita akan:

1. Melihat catatan tengkorak evolusi manusia dan catatan fosil
2. menyelesaikan catatan fosil





Kerjakan Sekarang

membuat catatan
bukti evolusi
manusia

hari ini kita akan:

1. membuat
catatan bukti-
bukti evolusi

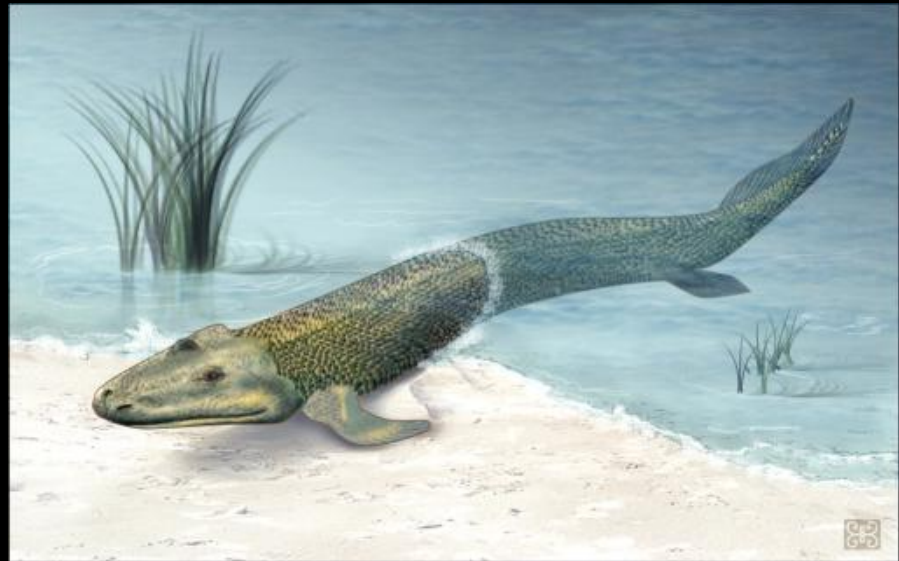
Kerjakan Sekarang

Tahun 2006, Ilmuwan menemukan fosil rangka ikan dengan fitur yang sangat menarik.

Bukti fosil menunjukkan bahwa binatang tersebut tidak hanya memiliki sisi dan insang, **tetapi juga memiliki paru-paru, seperangkat tulang rusuk, dan tulang tungkai yang menopang berat badan hewan tersebut**

Pertanyaan:

Mengapa kamu berpikir bahwa fosil Tiktaalik adalah bagian bagian penting bukti evolusi?

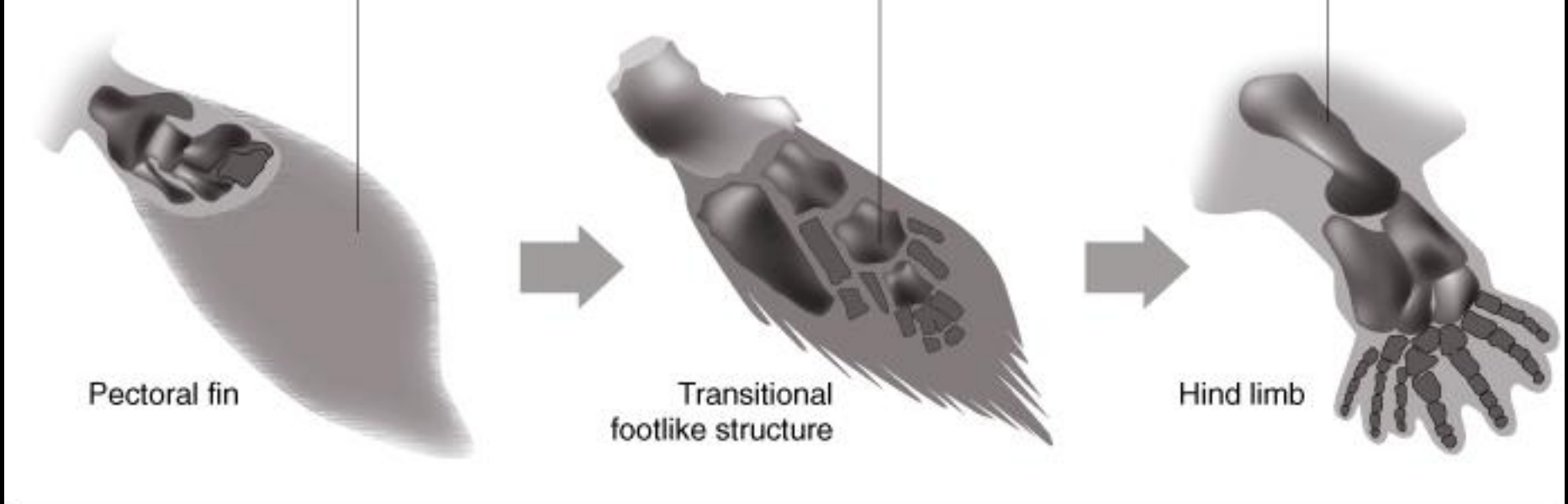
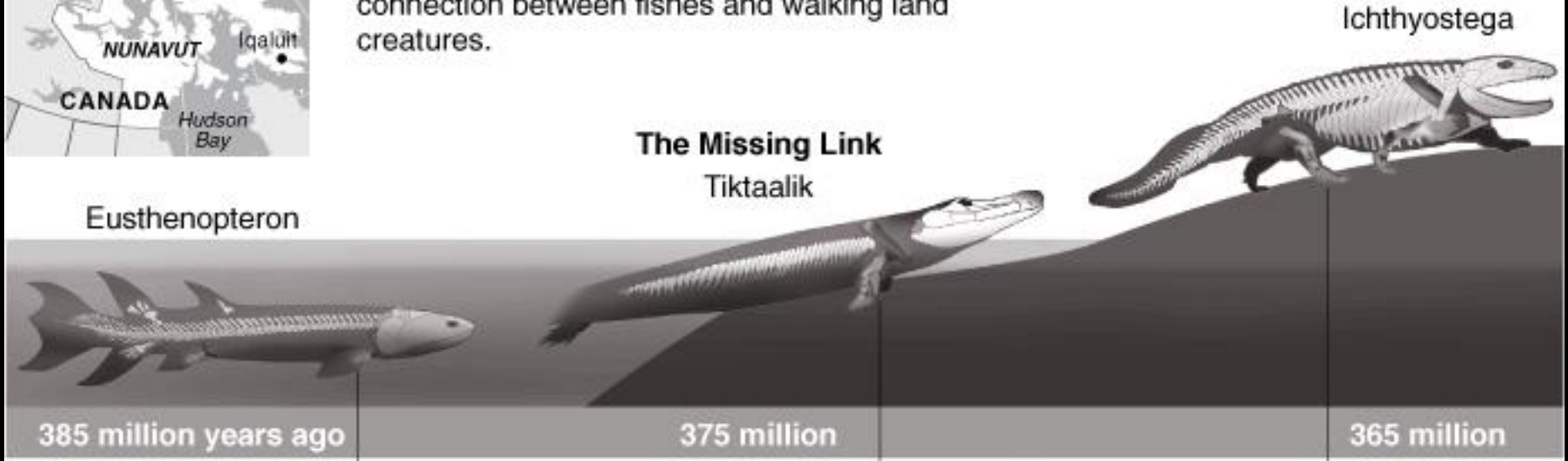


Take out ALL Evolution Notes
and have a copy of the yellow
Cells and Heredity book



A 'Missing Link' Is Found

With the discovery of fossils of the Tiktaalik, or "large shallow water fish," scientists have found a missing connection between fishes and walking land creatures.



Sources: "Book of Life," edited by Stephen Jay Gould; Nature

The New York Times; illustrations by Graham Roberts

Evolution could so easily be disproved if just

a single fossil

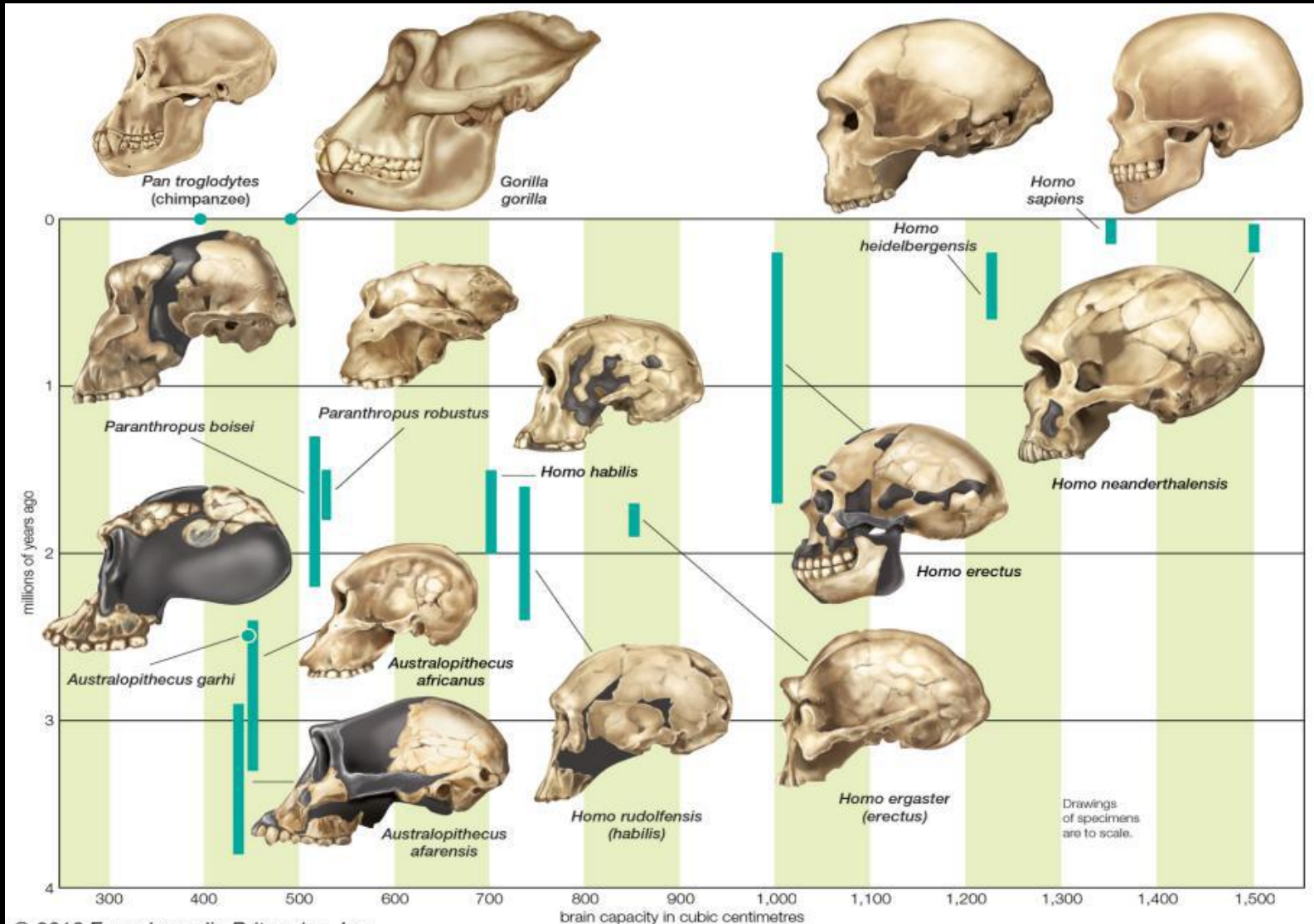
turned up in the wrong date order.

Evolution has passed this test with flying colours.

-Richard Dawkins

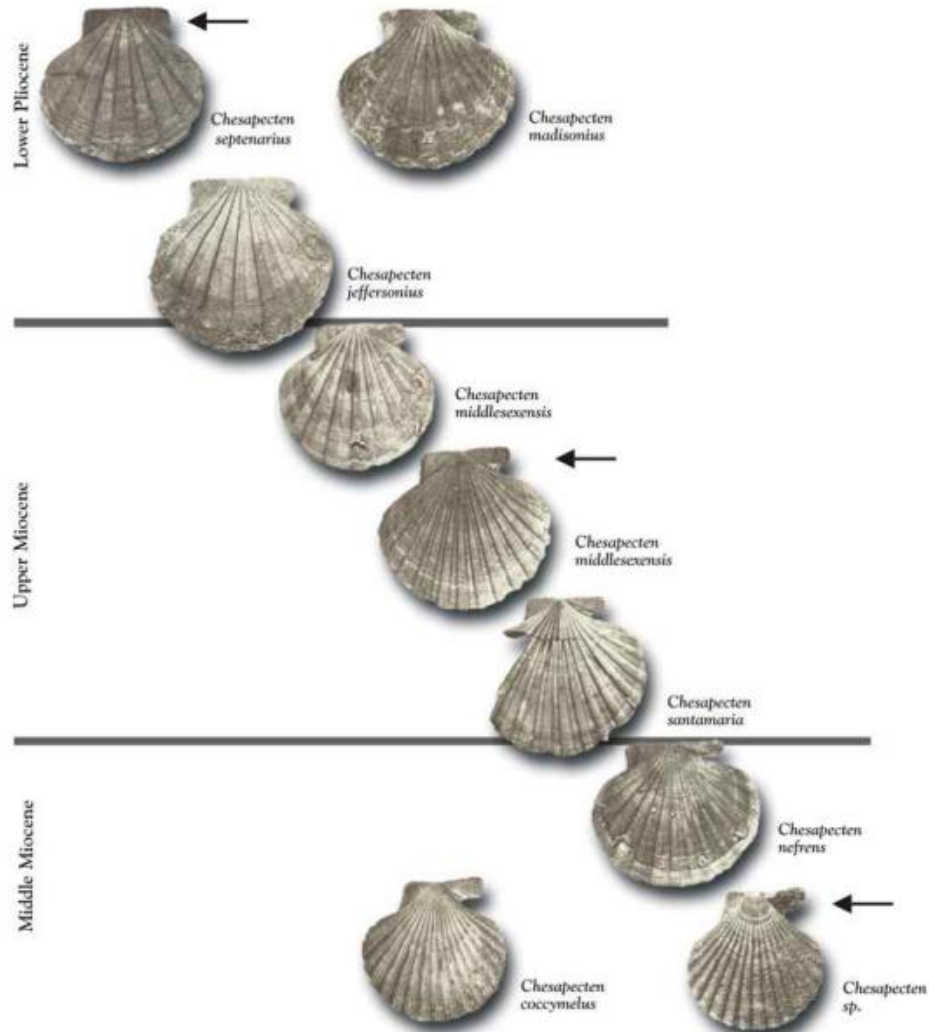
Catatan Fosil pada Evolusi Manusia:

Encyclopedia Britannica



Catatan Fossil

Chesapecten Scallops



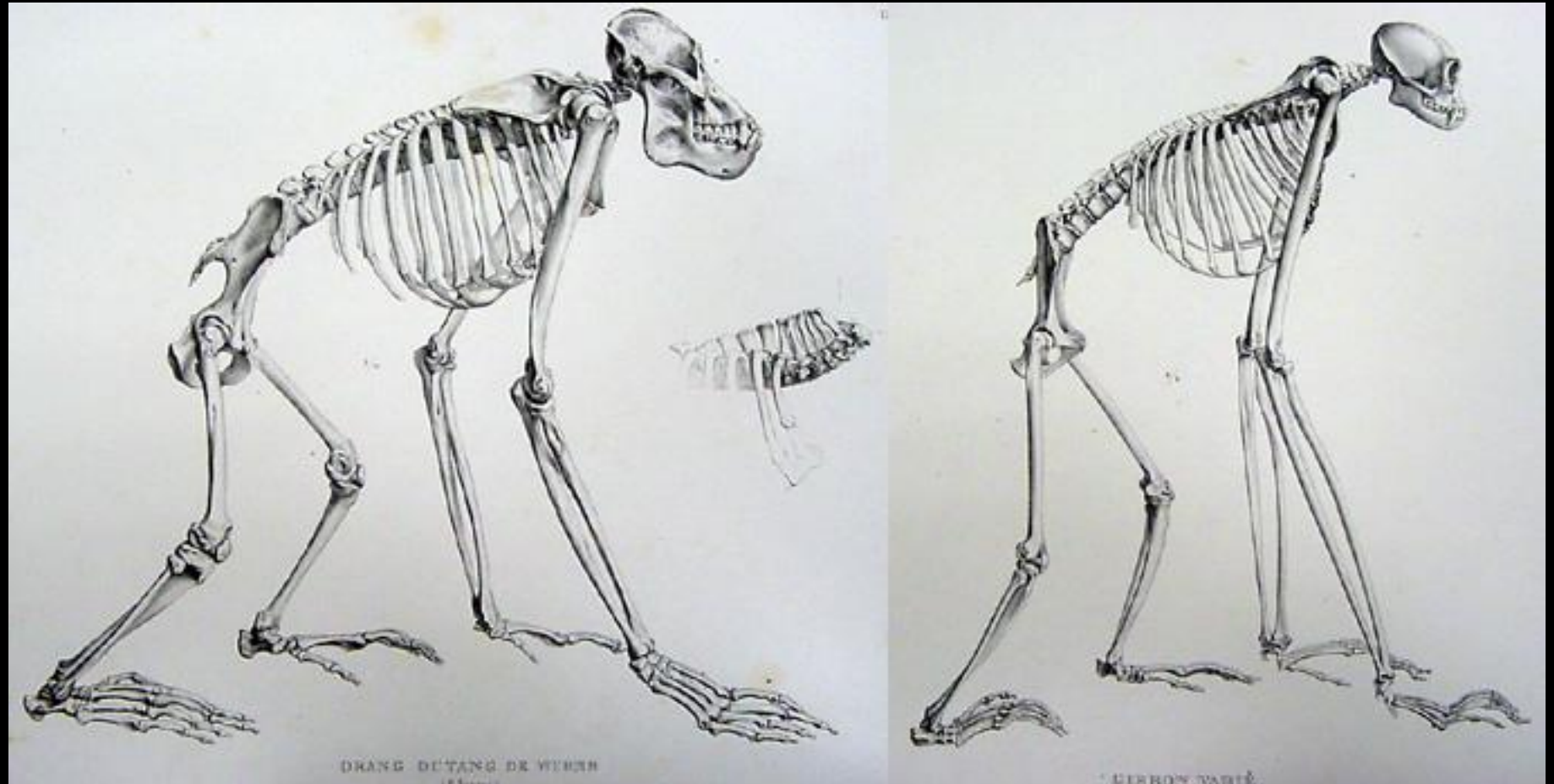
Catatan Fosil

- Penjelasan

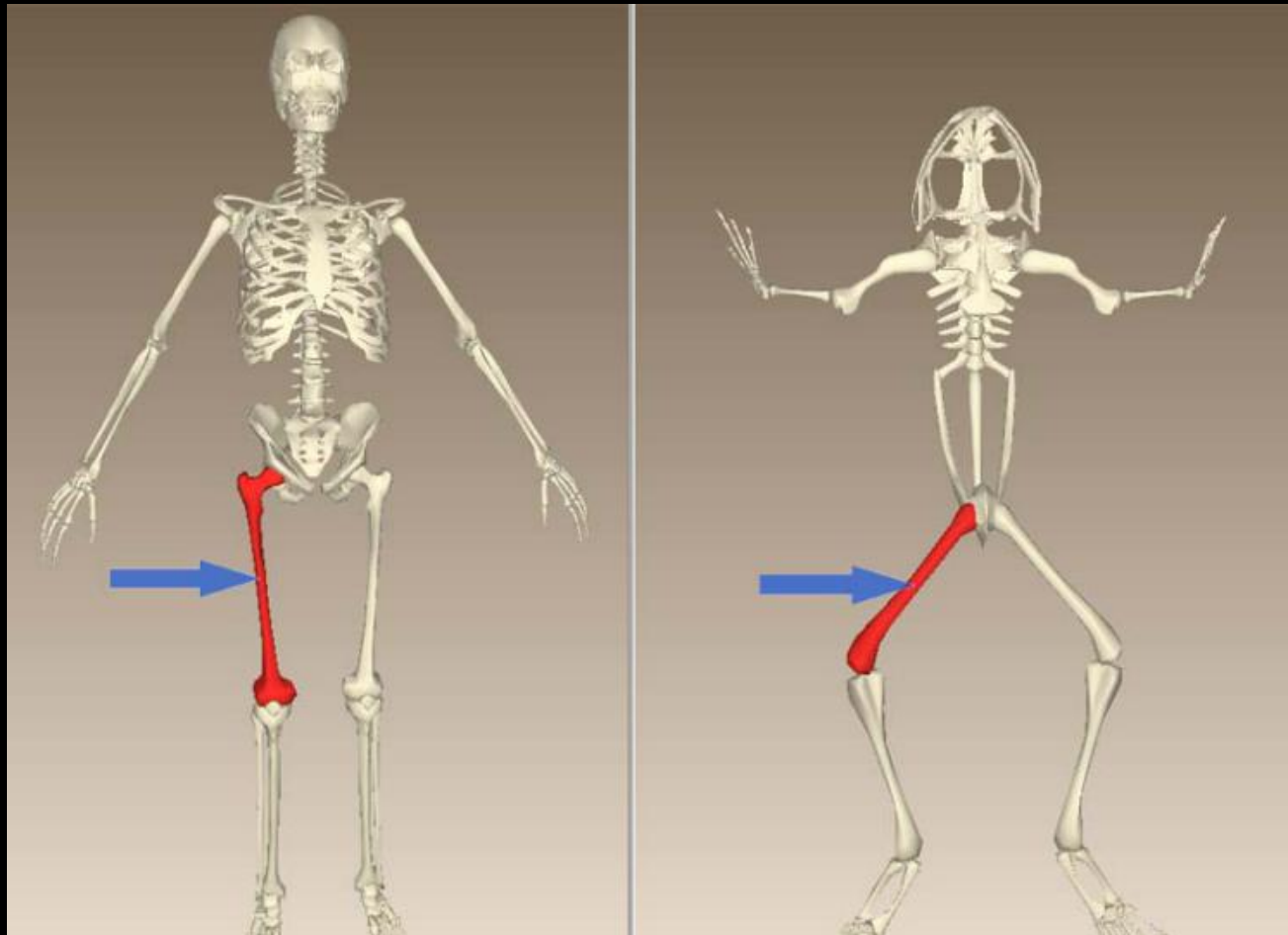
–**Jika** catatan fosil menunjukkan bukti yang berkelanjutan berupa perubahan kecil pada spesies, kepunahan dan perubahan tersebut terjadi selama waktu geologis....t

–**Maka** itu termasuk bukti **evolusi**.

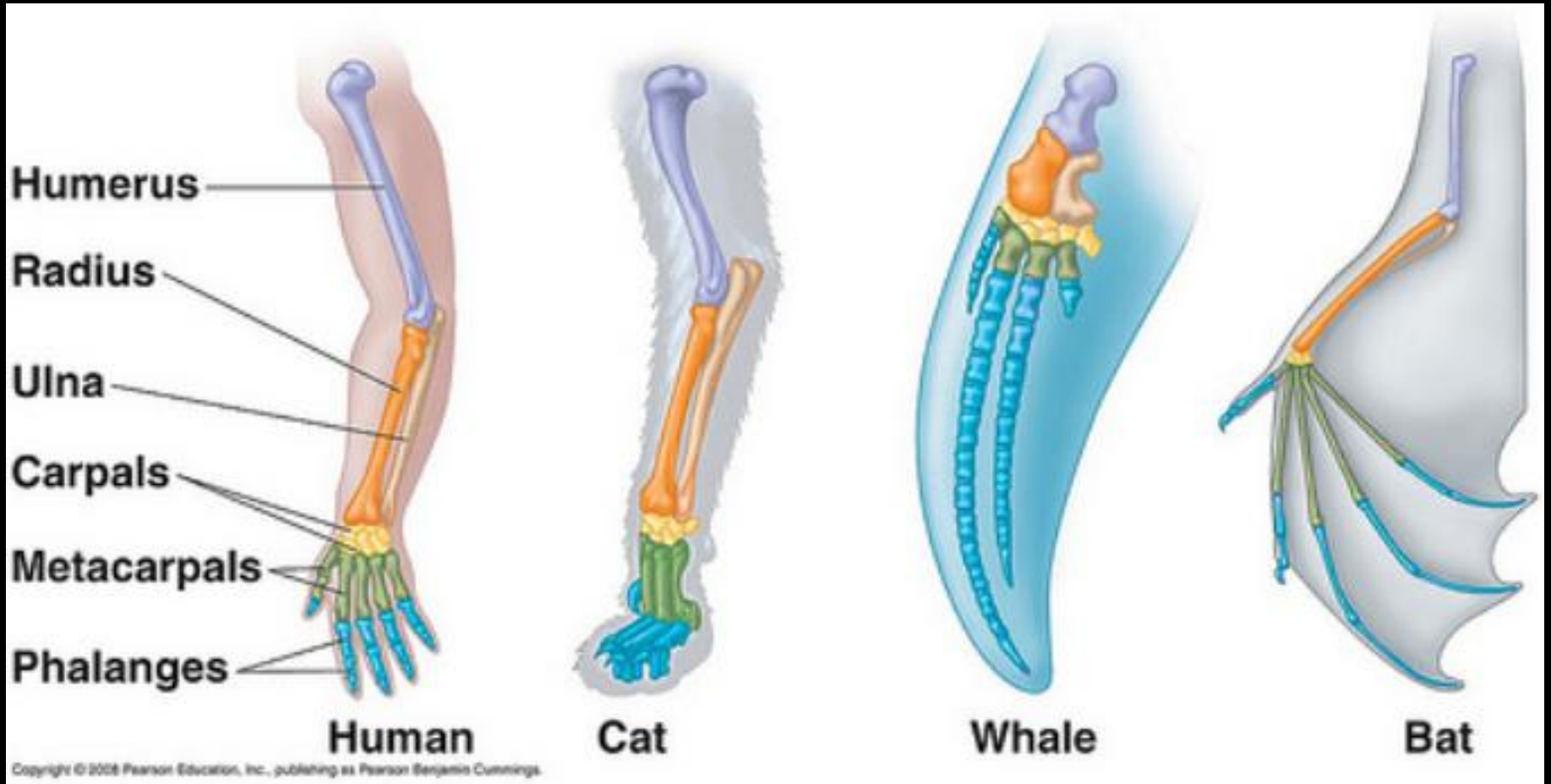
Anatomi Perbandingan



Anatomi Perbandingan



Anatomi Perbandingan



Anatomi Perbandingan

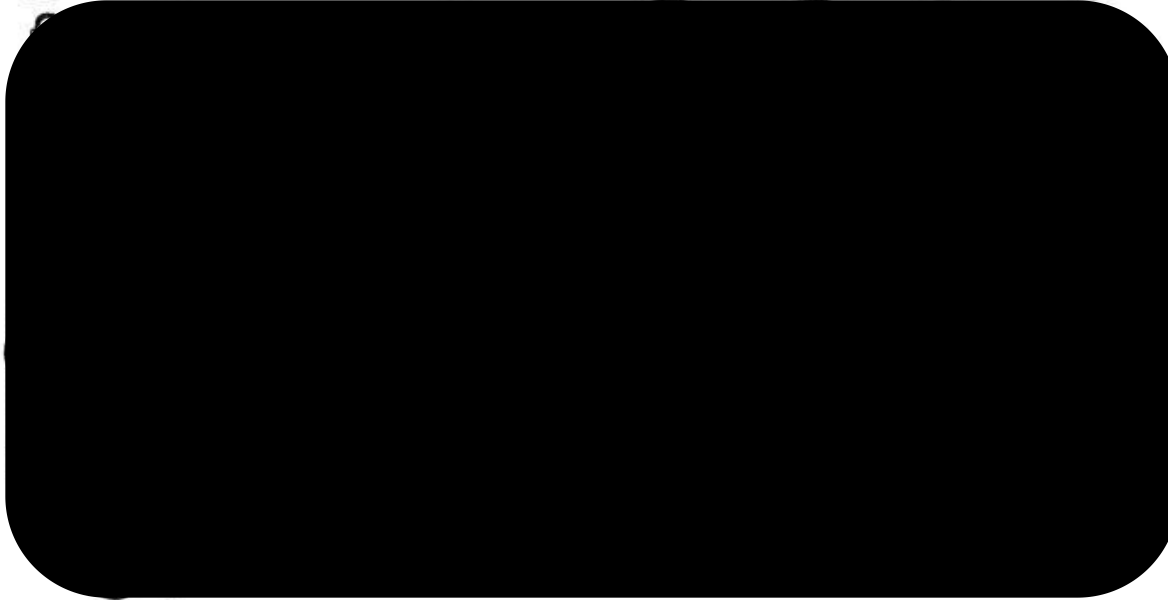
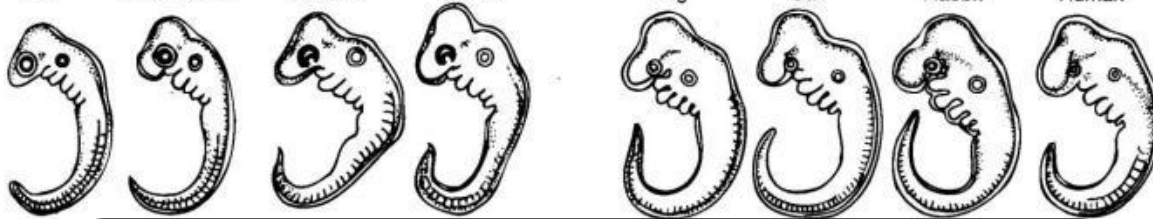
- Penjelasan...

–**Jika** organisme mempunyai persamaan anatomi (tulang... struktur...)

–**Kemudian** mereka pasti terhubung oleh sesuatu **Common Ancestor/nenek moyang bersama**

Embryology

What organisms do you think starts like this?



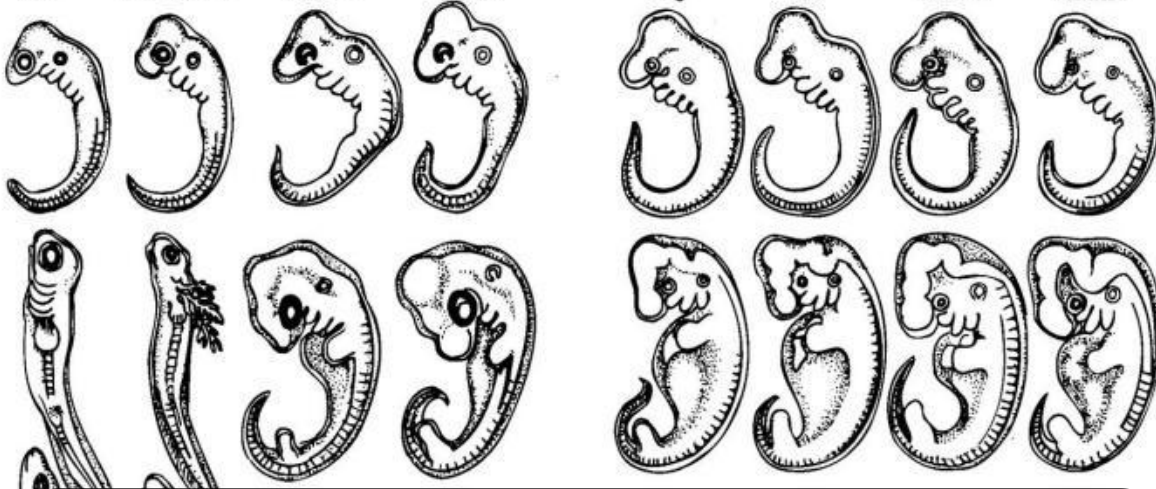
Early



Late

Embryology

What organisms do you think starts like this?



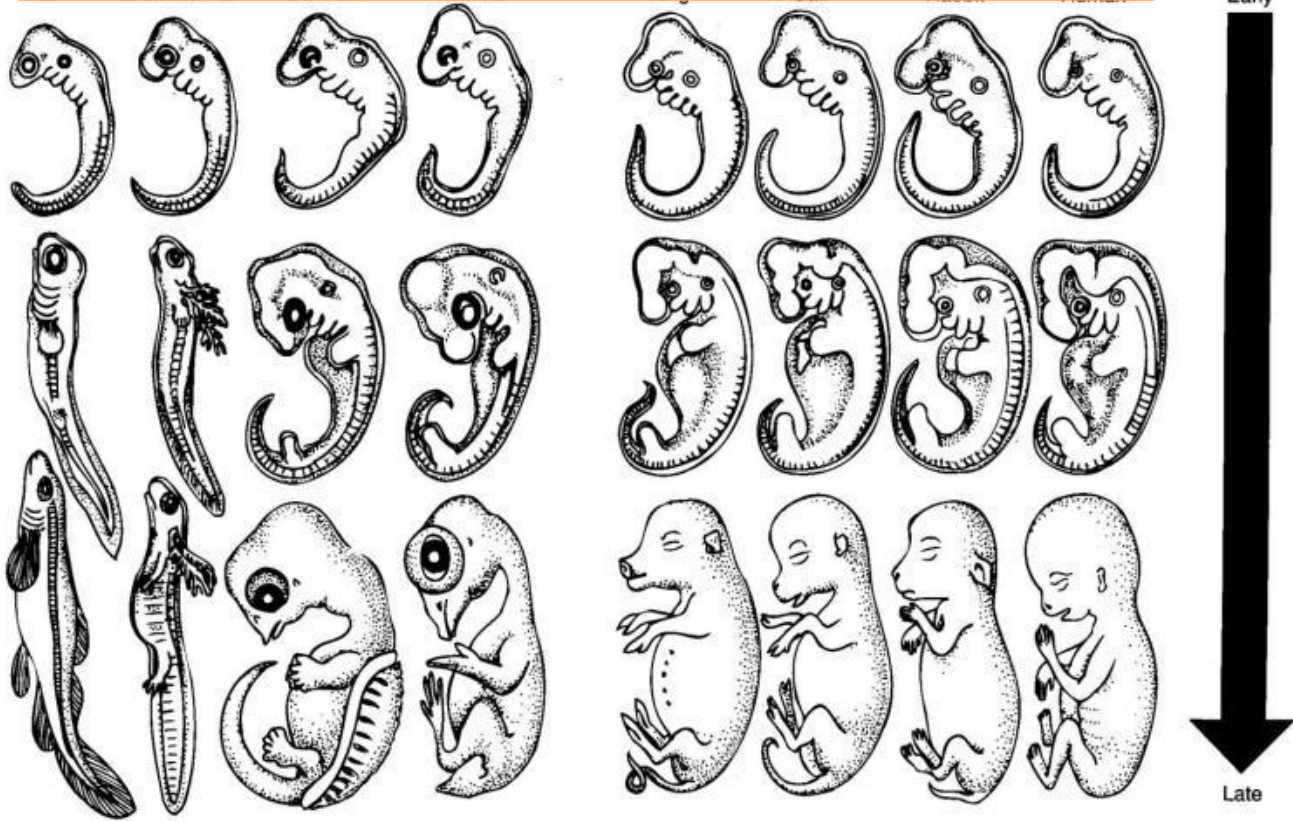
Early



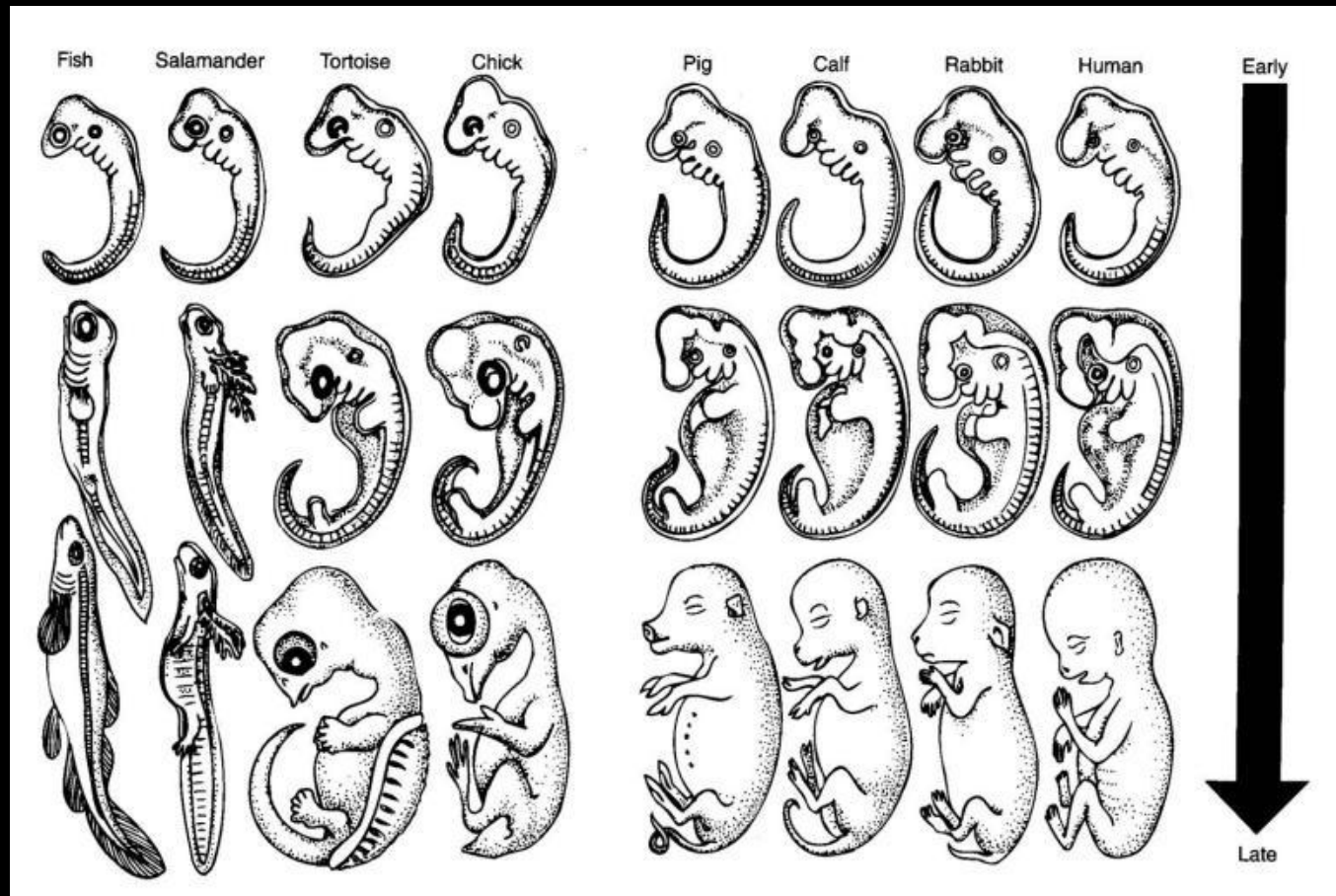
Late

Embryology

What organisms do you think starts like this?



Embryology



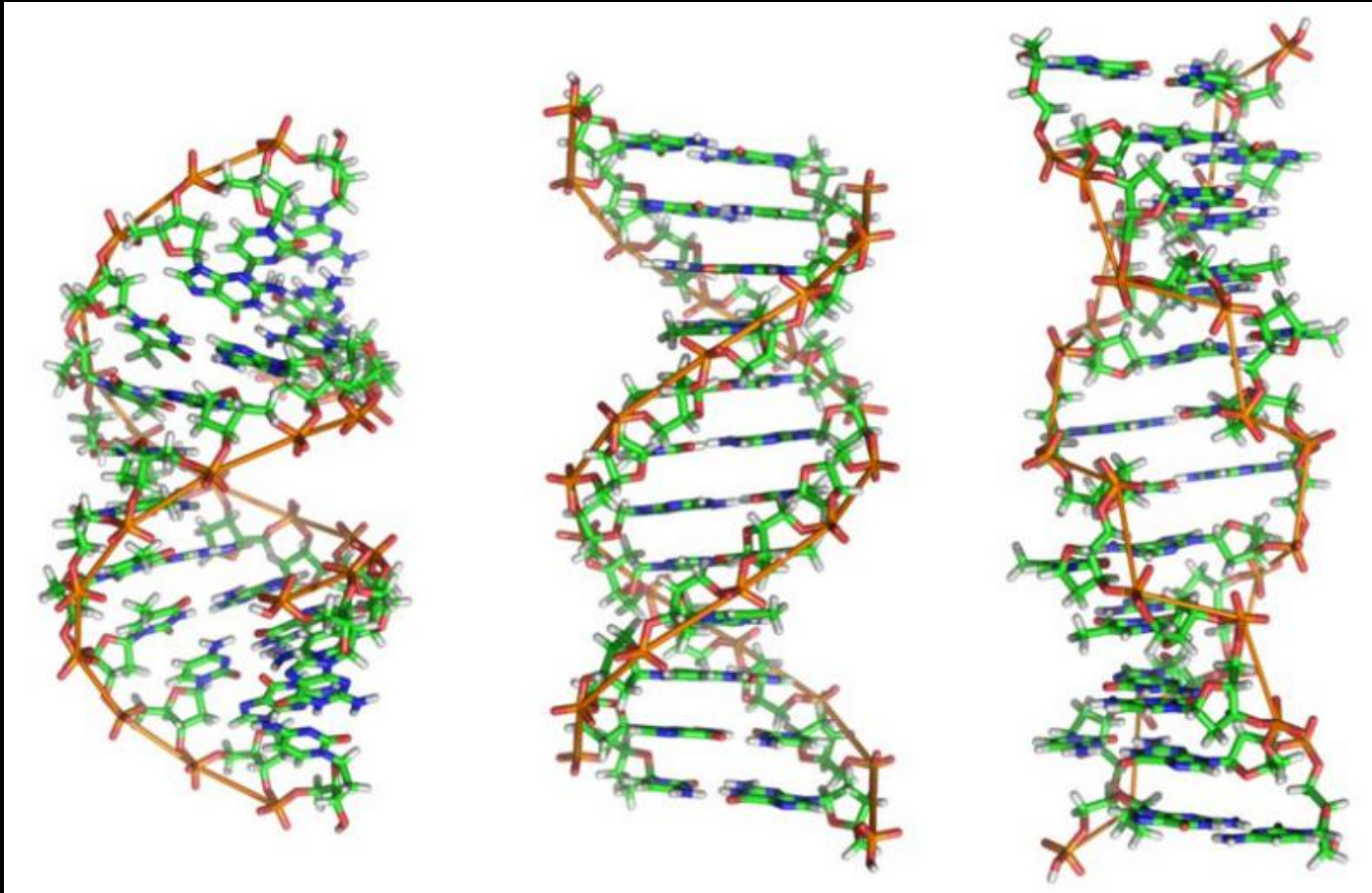
Embryology

- Penjelasannya...

– **Jika** organisme memiliki persamaan tahap embrio (tahap awal perkembangan)

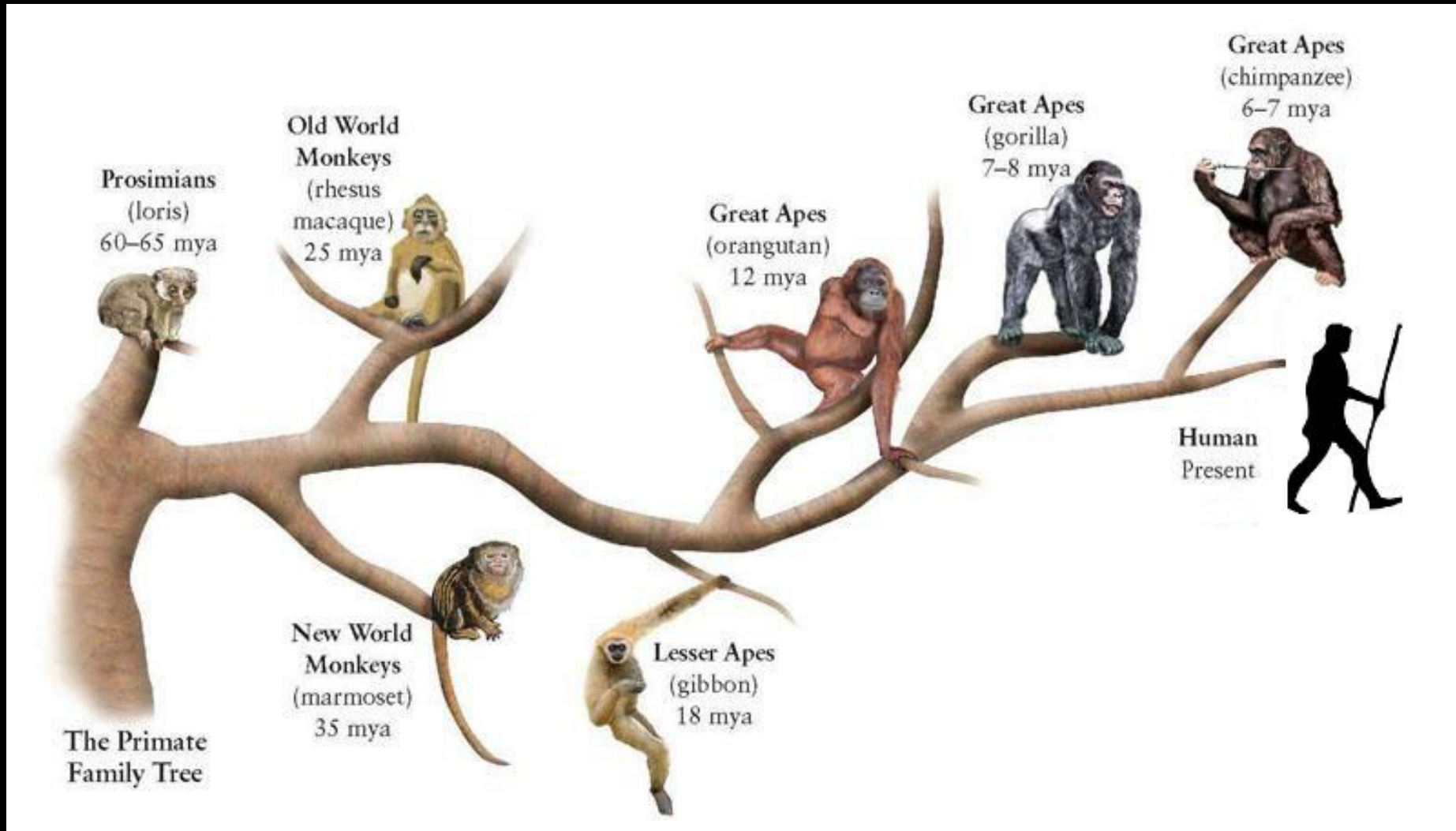
– **Kemudian** mereka pasti terhubung oleh **Common Ancestor/nenek moyang bersama**

Comparative DNA



Jika DNA nya sama/mirip **kemudian** mereka pasti terhubung oleh **common ancestor/nenek moyang bersama.**

Branching Tree of Primates



And here is what the bones look like...
like...



Gibbon

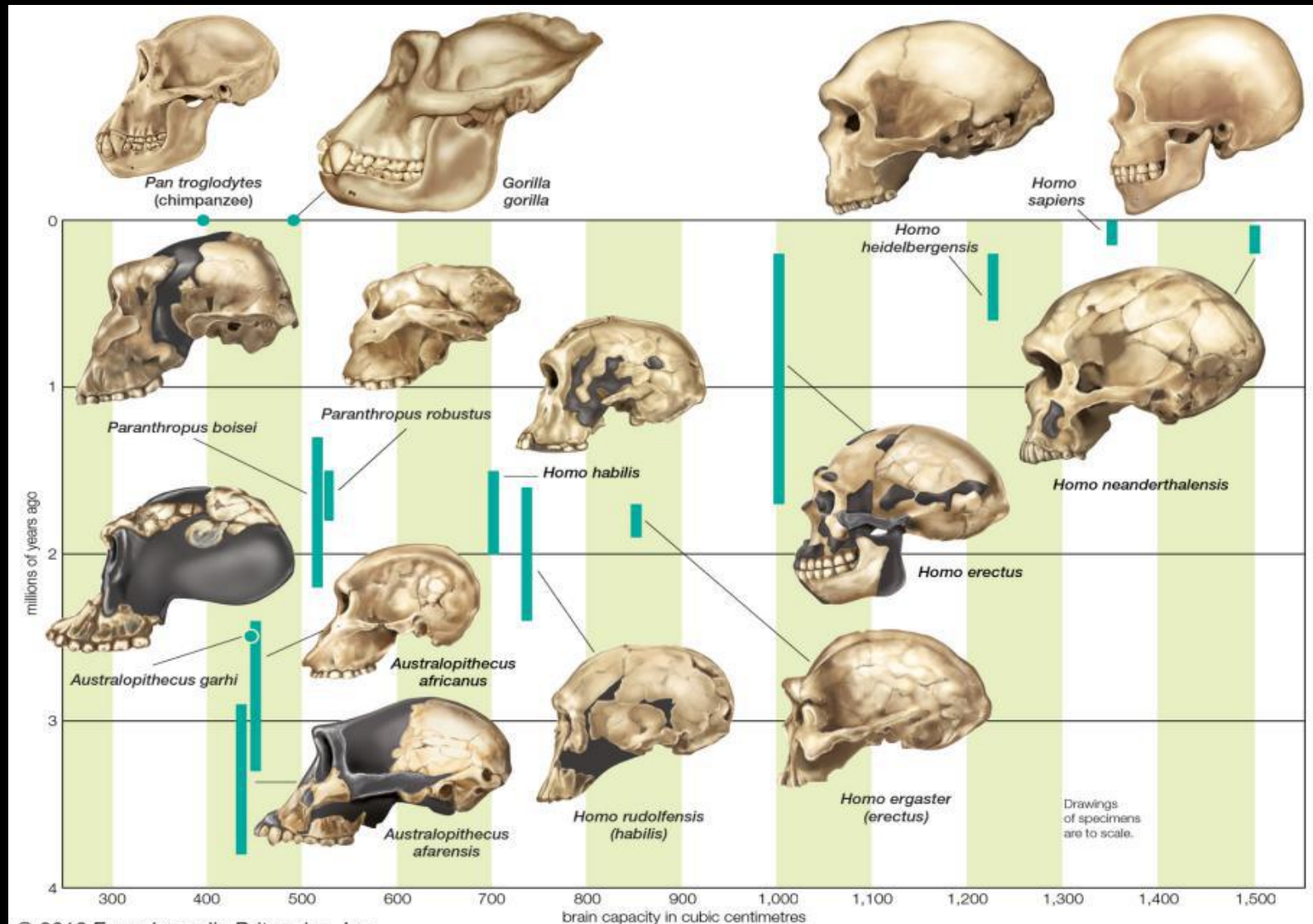
Human

Chimpanzee

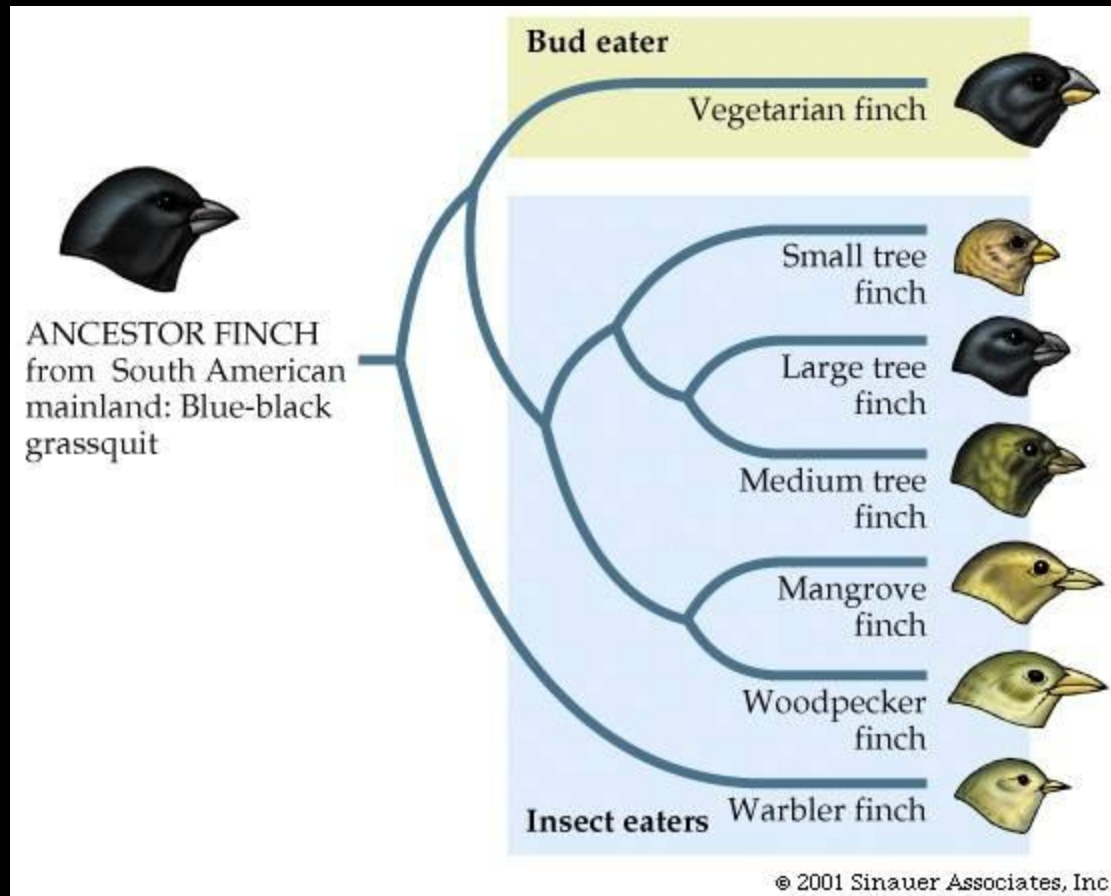
Gorilla

Orangutan

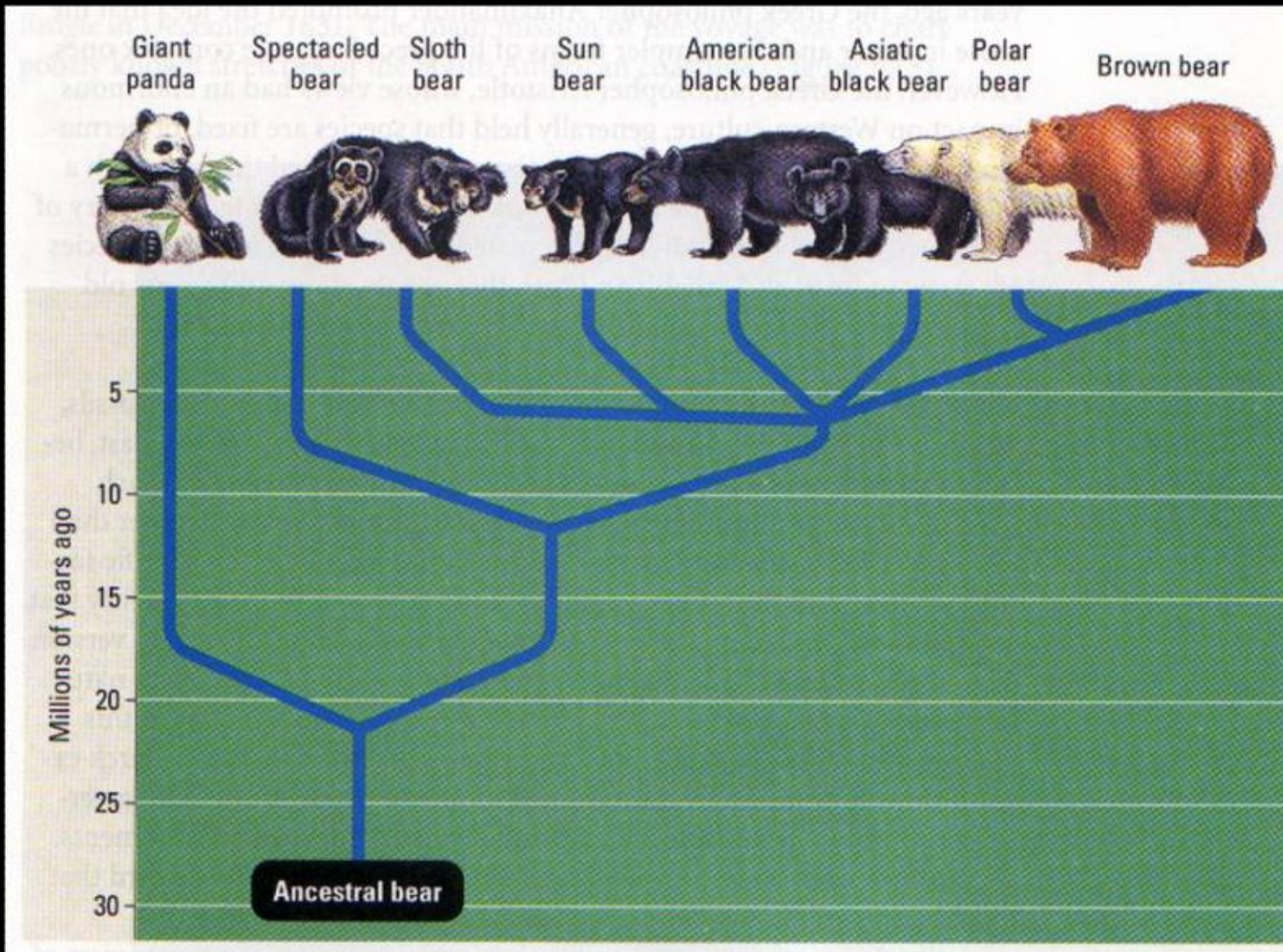
The Fossil Record of Human Evolution: Encyclopedia Britannica



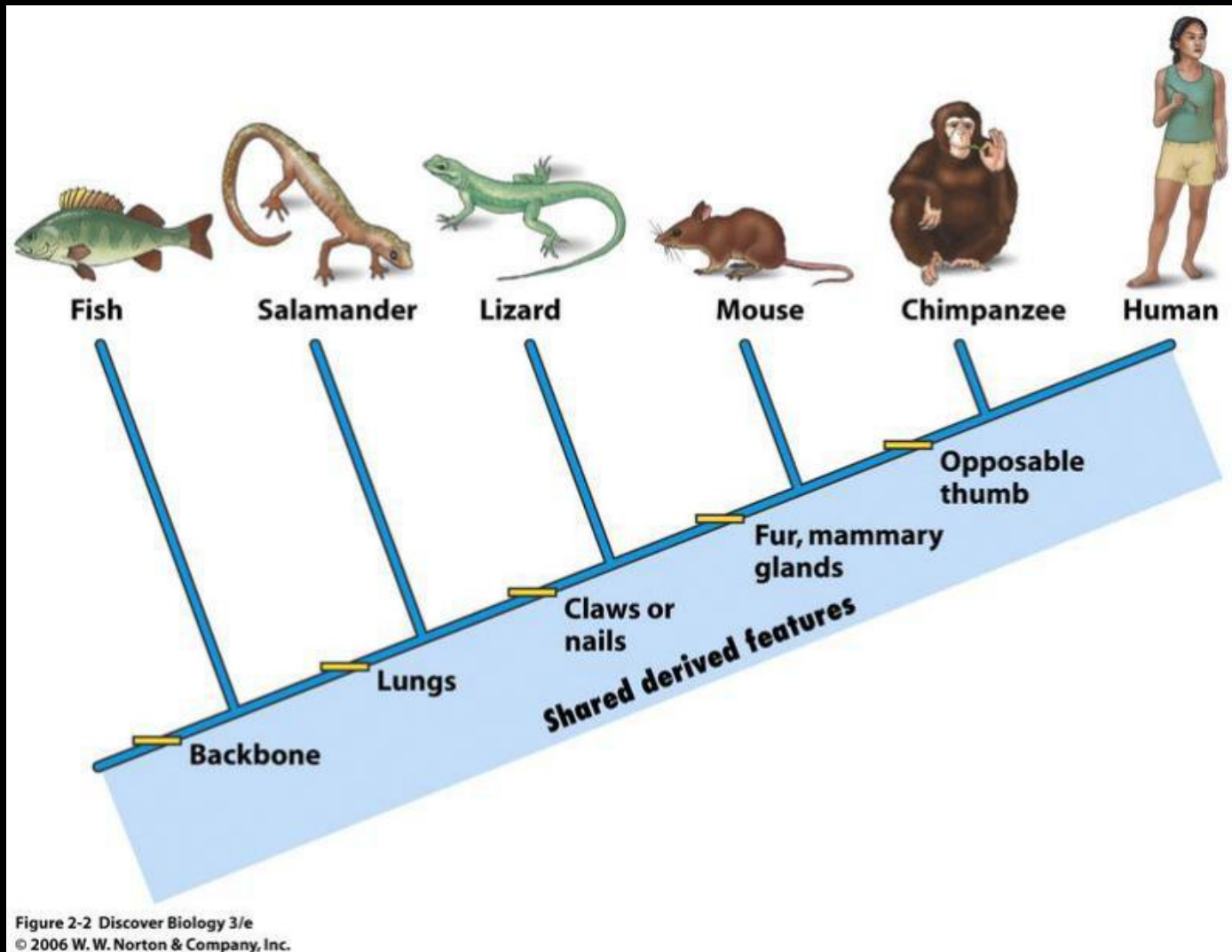
Branching Tree of Finches



Branching Tree of Bears



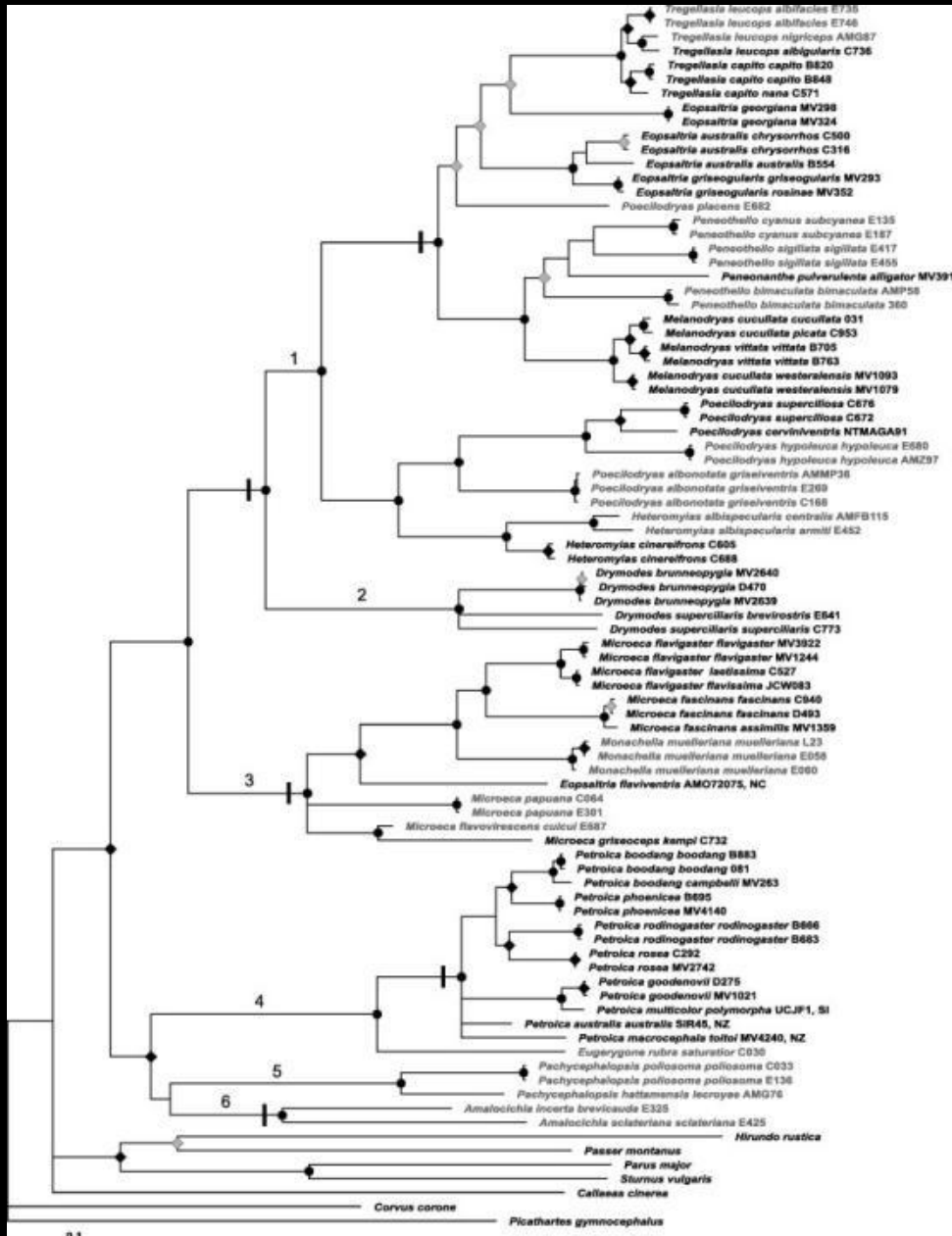
Simple Branching Tree of Life



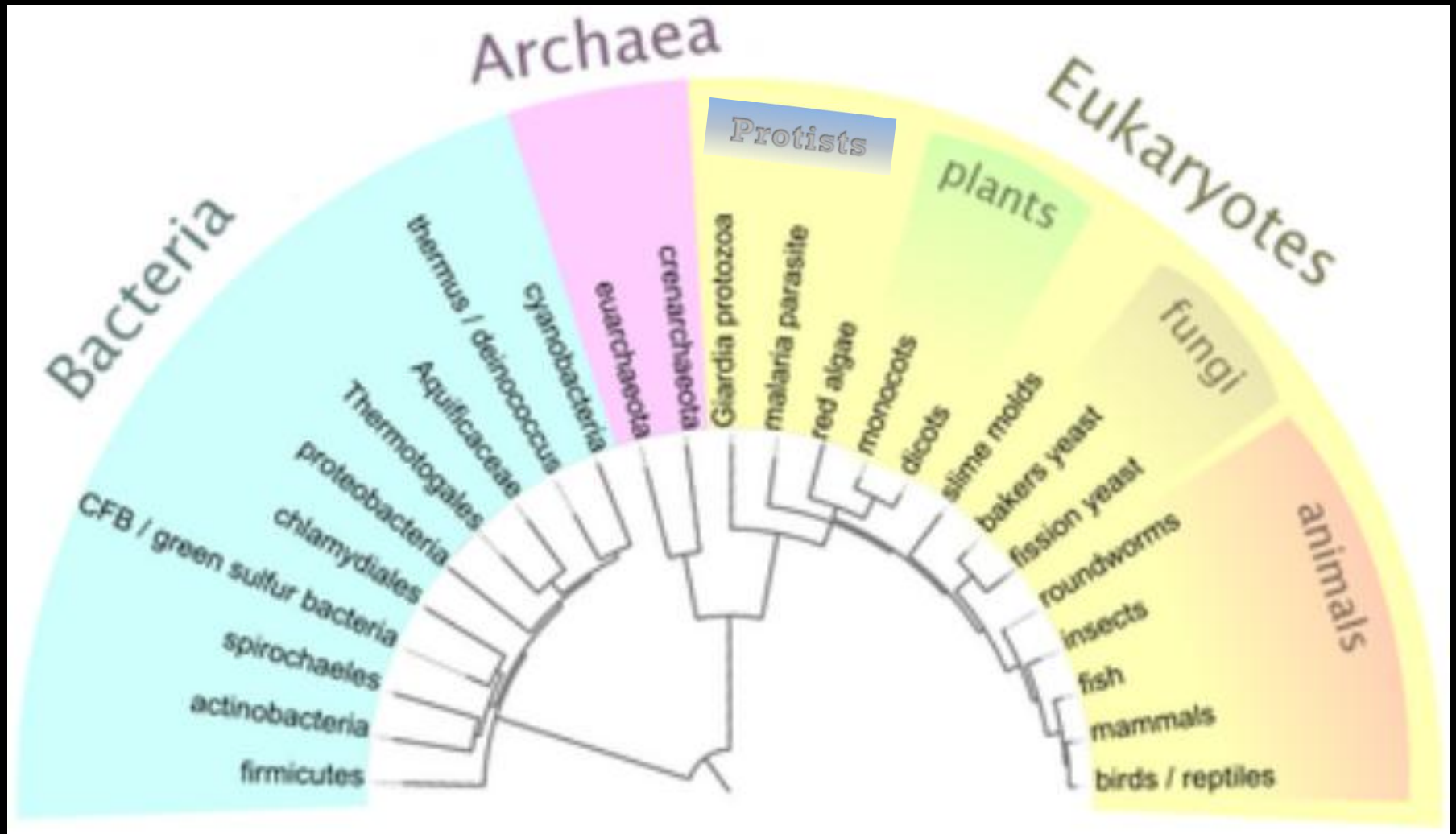
Complex Branching Tree of Life

... and even this is
incomplete ...

There are over 200
million species on Earth
and we are all
somewhere on the
evolutionary tree of life
branching off at
different points



A Branching Tree of all of the Kingdoms of Life



Silsilah Makhluk Hidup

- Penjelasan:
 - Ketika Anda **mengkombinasi semua bukti** pada diagram silsilah makhluk hidup, menunjukkan bahwa semua makhluk hidup (organisme) **saling terhubung** dengan yang lainnya.

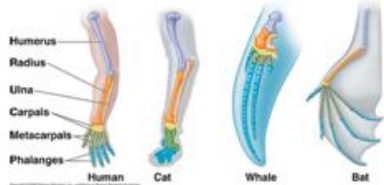
Name _____ Date _____ Div _____

Evidence for Evolution

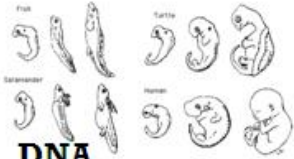
The Fossil Record



Comparative Anatomy



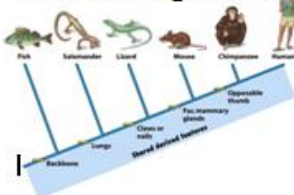
Embryology



DNA



Branching Tree



The Argument:

If _____

Then _____

If _____

Then _____

If _____

Then _____

If _____

Then _____

Do Now

← Take out your Evidence for Evolution Sheet

Today we will:

1. Finish the evidence notes on the Branching Tree
2. Complete a short lab with partners on Homologous Structures