Last class

- What are all the species in the Australopithecines?
- Which are robust? Which are gracile? What are the differences between robust and gracile?
- When do they occur in time? Space?
- How did they live? What did they eat? Where did they live?
- What are the possible phylogenies of the Pliocene hominids?

A. sediba

http://www.wired.com/wiredscience/2011/04/australopithecus-fossils-human-evolution/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+wiredscience+%28Blog+-+Wired+Science%29

Last time...

- What defines the genus *Homo?*
- When does *Homo* first appear? Where?
- How do we identify these fossils as *Homo* rather than *Australopithecus?*
- How are *Homo habilis* different from the other hominids they are contemporaneous with?

Homo habilis

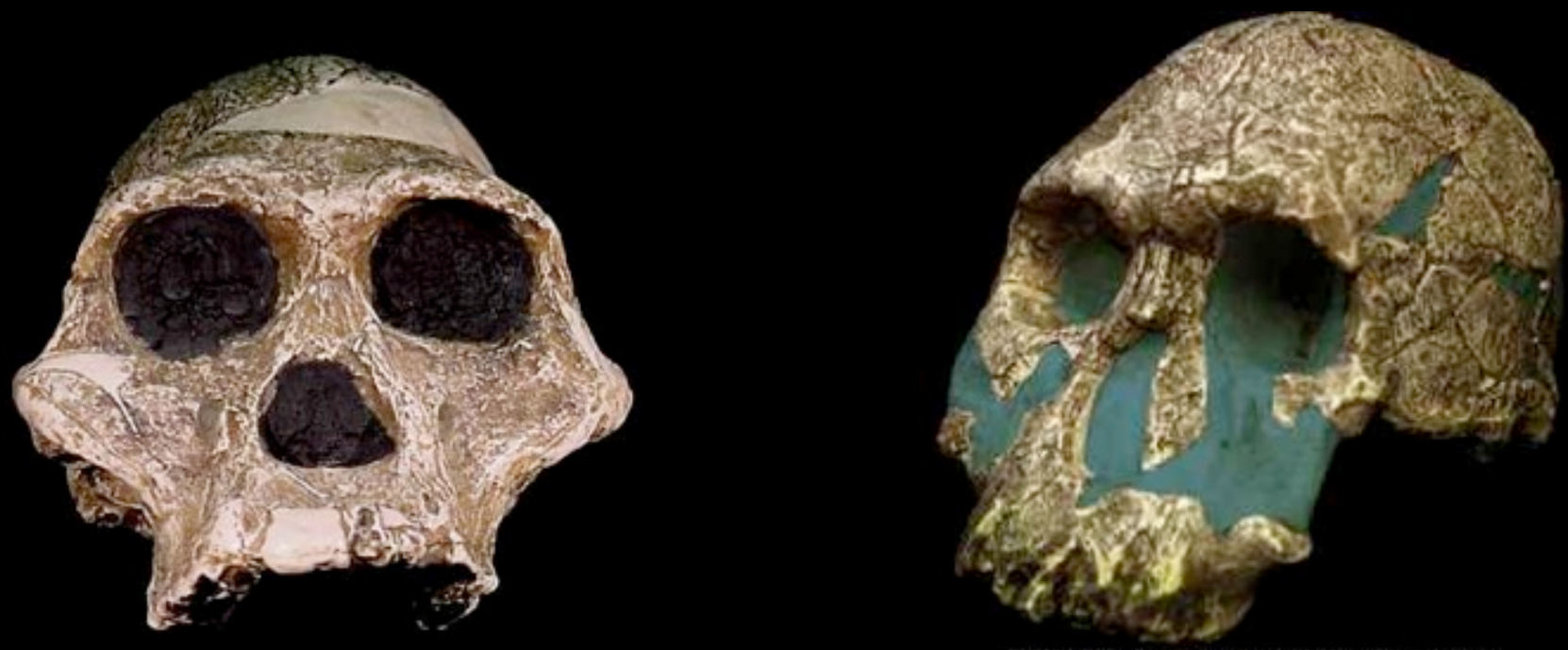
- Where and when is *Homo habilis* found?
- What are its defining charateristics?
- Why is it considered *Homo* rather than *Australopithecus?*
- How is it similar and dissimilar from *Australopithecus sediba?*
- How is it similar and dissimilar from *Homo rudolfensis?*

Defining *Homo*

- Rasmussen: Primate genus containing species of relatively small-toothed, big-brained, stone-tool-making hominids
- Walker: relatively large brain cases, completely modern limb proportions, and relatively small teeth
- Wolpoff: expanded cranial capacity, reduced canine size, precision grip

Homo habilis

Australopithecus v. Homo habilis



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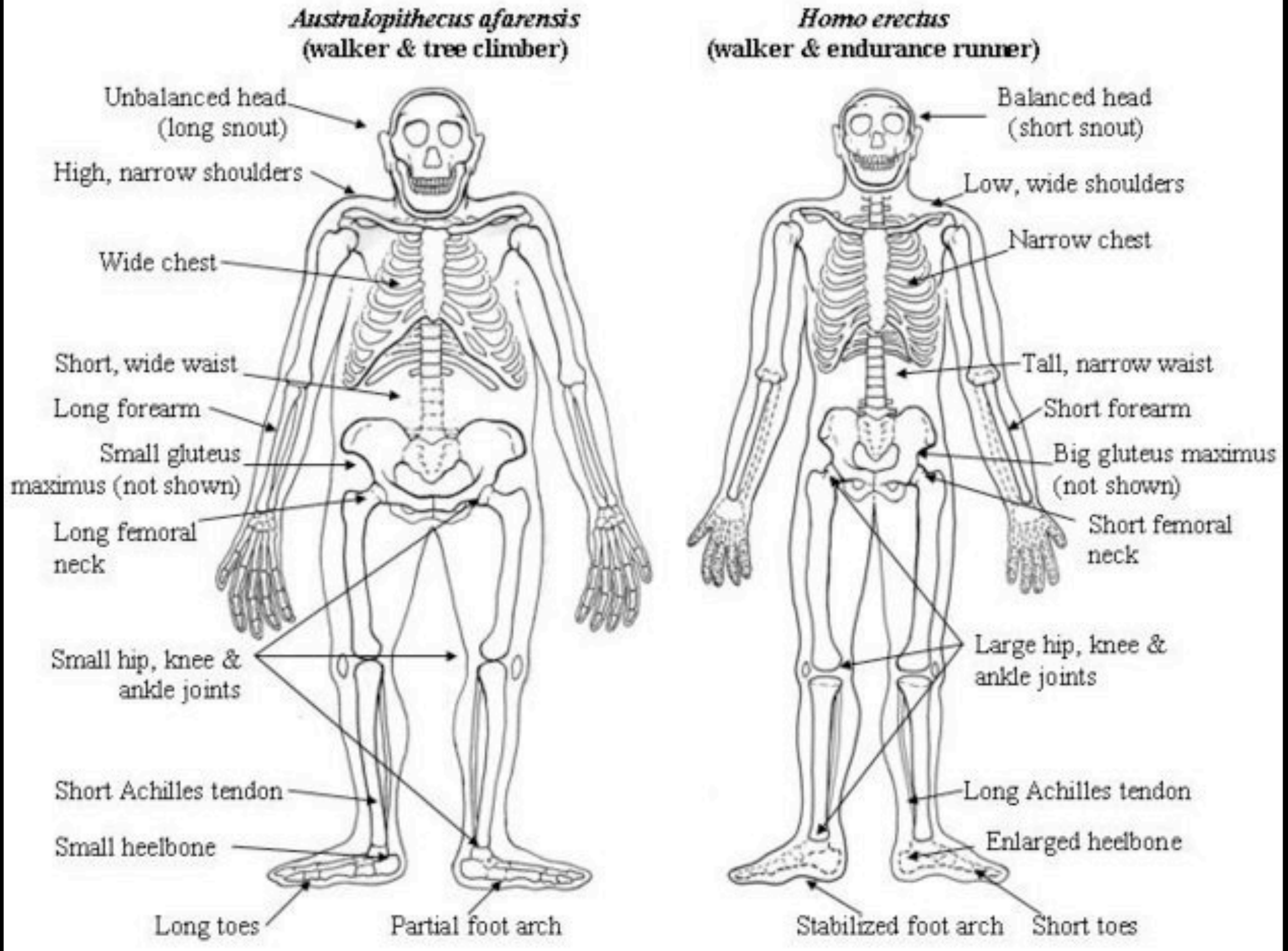

Australopithecus afarensis
(walker & tree climber)
Unbalanced head (long snout)
High, narrow shoulders
Wide chest
Short, wide waist
Long forearm
Small gluteus maximus (not shown)
Long femoral neck
Small hip, knee & ankle joints
Short Achilles tendon
Small heelbone
Long toes
Partial foot arch
Homo erectus
(walker & endurance runner)
Balanced head (short snout)
Low, wide shoulders
Narrow chest
Tall, narrow waist
Short forearm
Big gluteus maximus (not shown)
Short femoral neck
Large hip, knee & ankle joints
Long Achilles tendon
Enlarged heelbone
Stabilized foot arch
Short toes

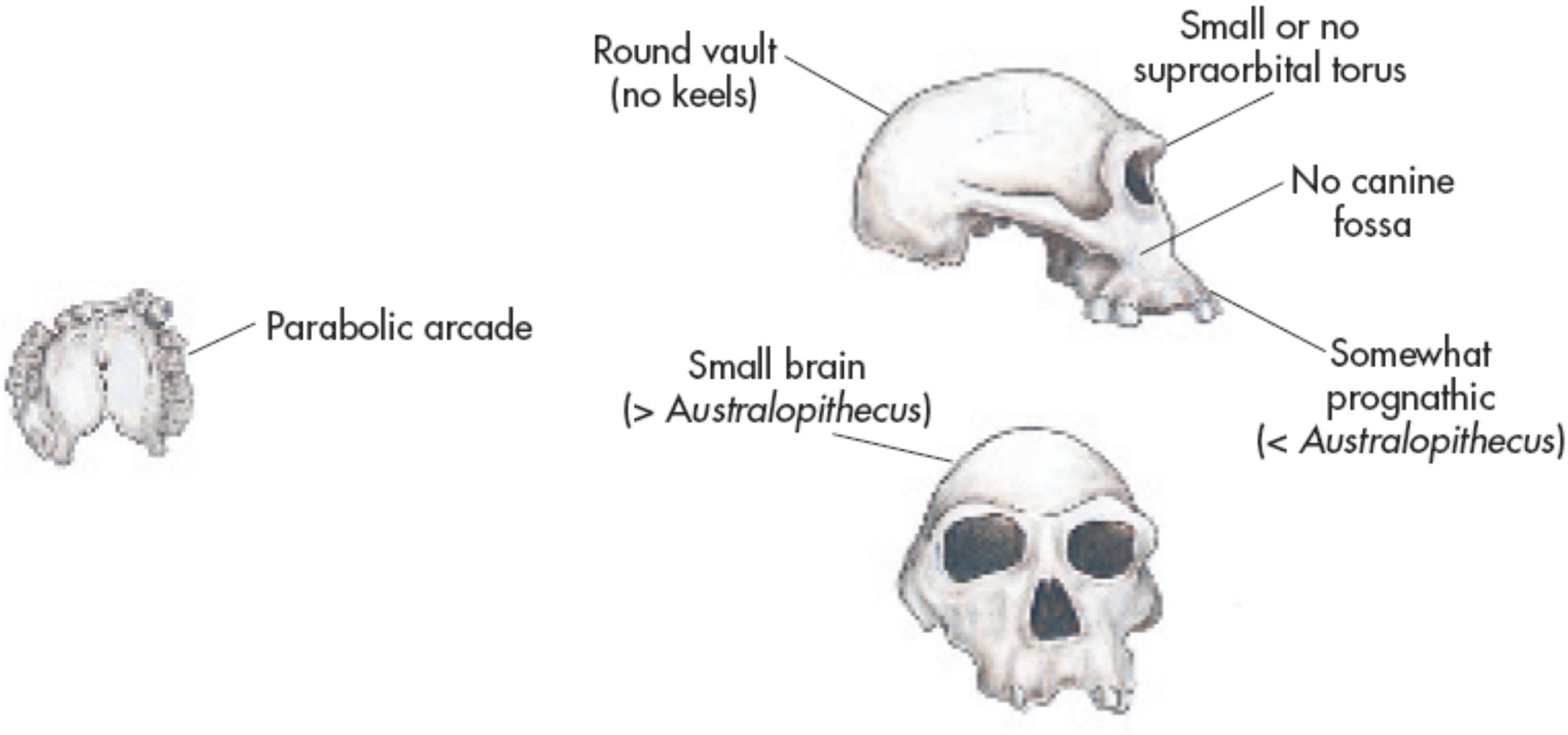
Homo

- brain size greater than 500 cc
- smaller, less prognathic face
- smaller teeth than the australopithecines
- more efficient bipedalism

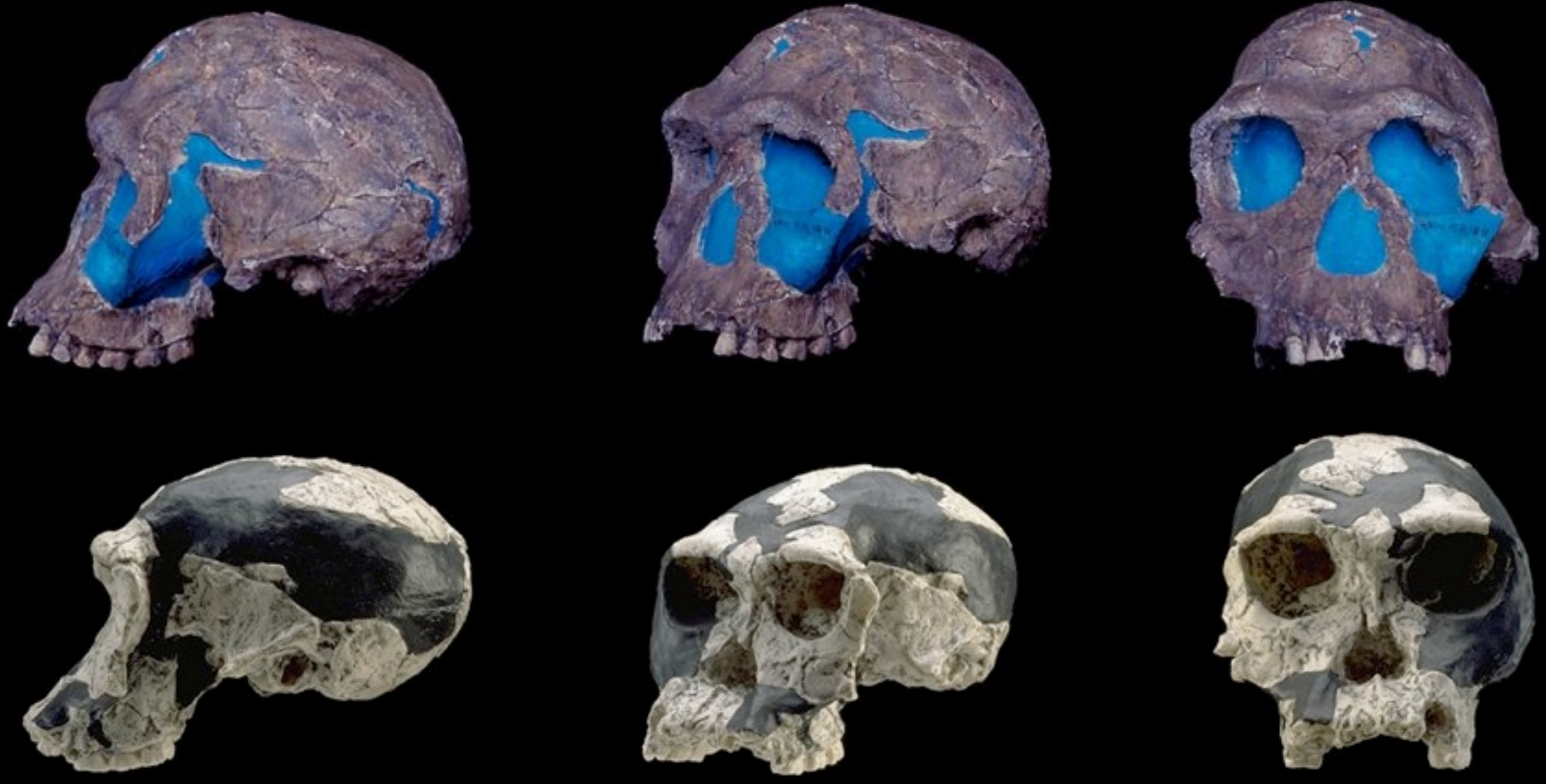
Homo species

- *Homo habilis*
- *Homo rudolfensis*
- *Homo georgicus*
- *Homo ergaster*
- *Homo erectus*
- *Homo floresiensis*
- *Homo heidelbergensis*
- *Homo rhodesiensis*
- *Homo antecessor*
- *Homo neandertalensis*
- *Homo sapiens*

Homo habilis



Homo habilis



Homo rudolfensis

Homo rudolfensis

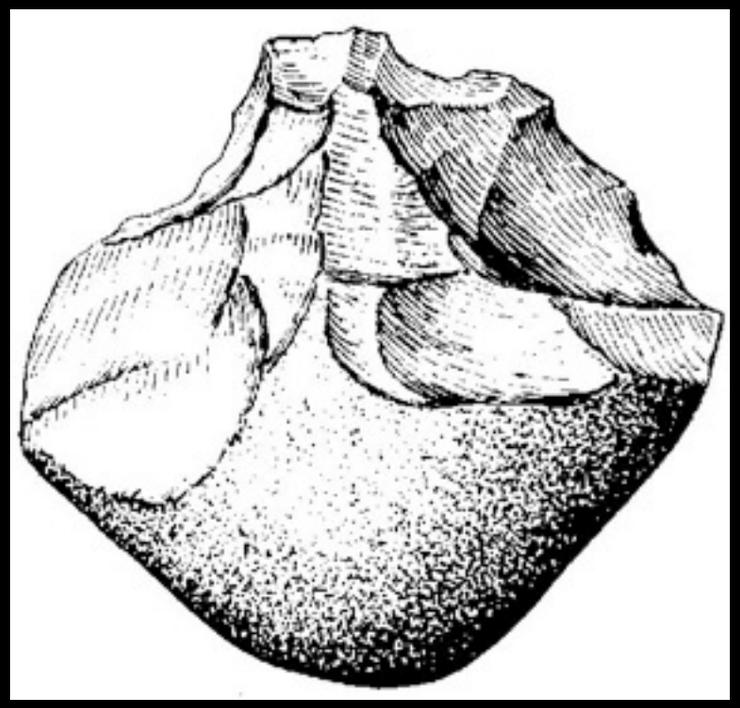
- *Homo habilis* or something different?
- *A. rudolfensis*?
- larger body than. *H. habilis*
- larger brain than *H. habilis*
    - but smaller EQ
- bigger teeth than *H. habilis*

Why *Homo?*

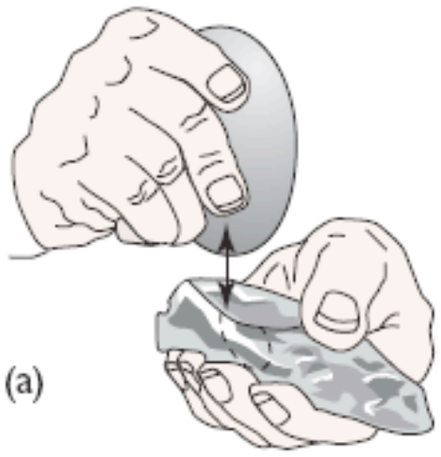
- What is the adaptive pattern of early *Homo?*
- Why were big brains and small teeth suddenly and strongly selected for?

Savanna-Woodland

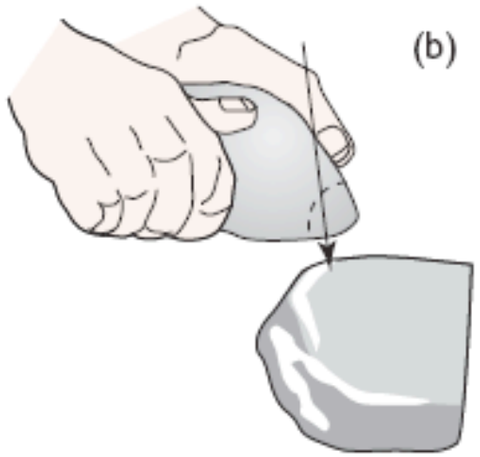
Olduwan Chopper

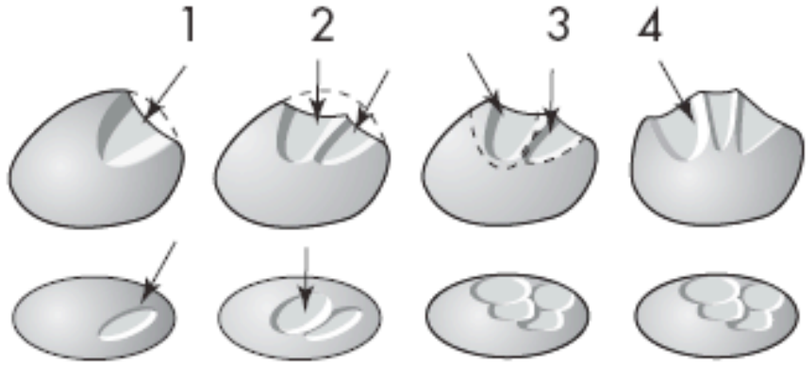


How to make an Olduwan Chopper



(a)





(b)

(c)

Kanzi

- http://www.youtube.com/watch?v=1zsSH9UUQtQ

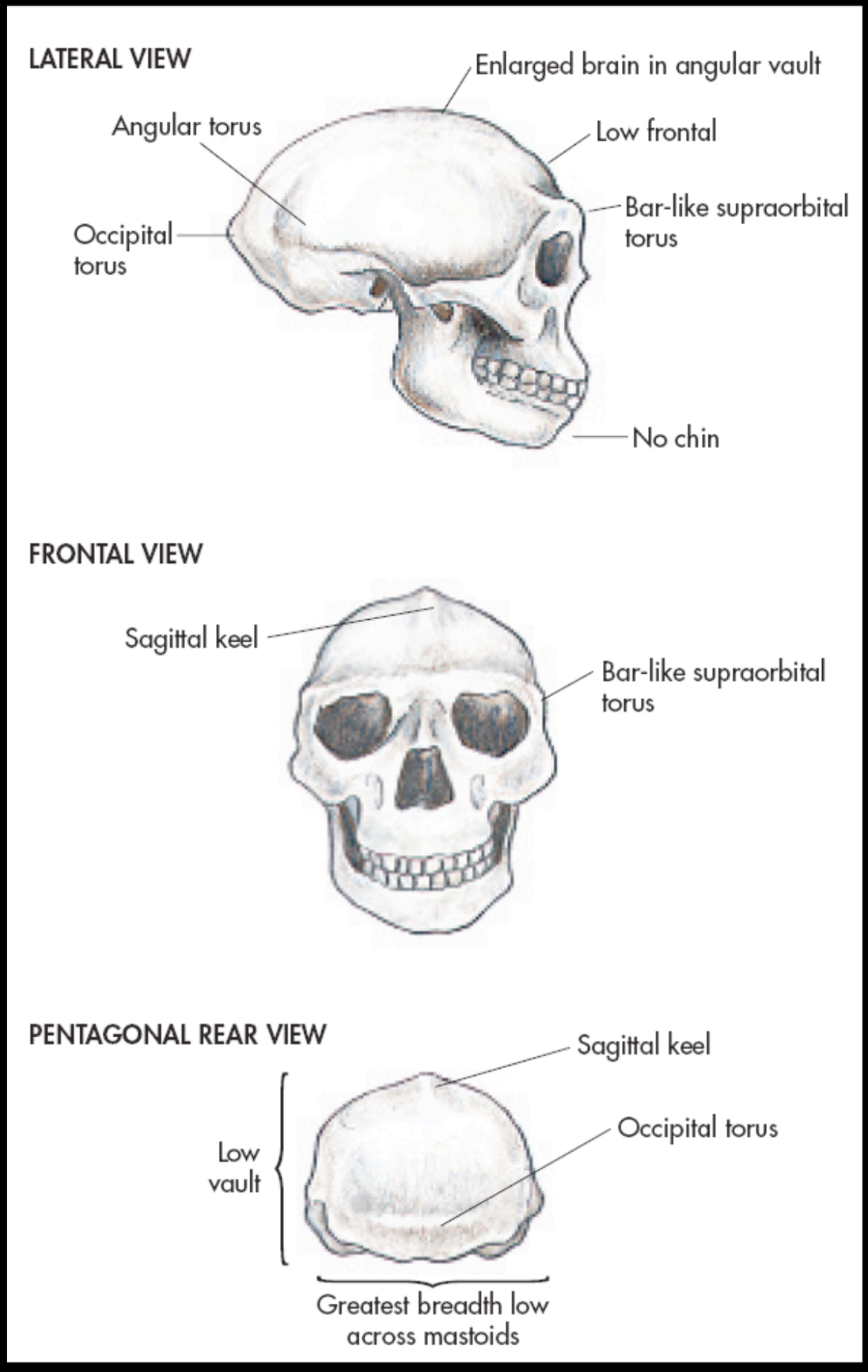
Olduwan tools

Homo erectus

- an extinct species of relative large African and Eurasian hominids characterized by a modern post-cranium, slightly projecting face, pronounced superorbital torus, and medium sized brain (by hominid standards)

Homo erectus

- sagittal keel
- long, low skull
- nuchal torus
- supraorbital torus
- broad, flat nasal bones
- large mandibles, no chin
- shovel-shaped incisors

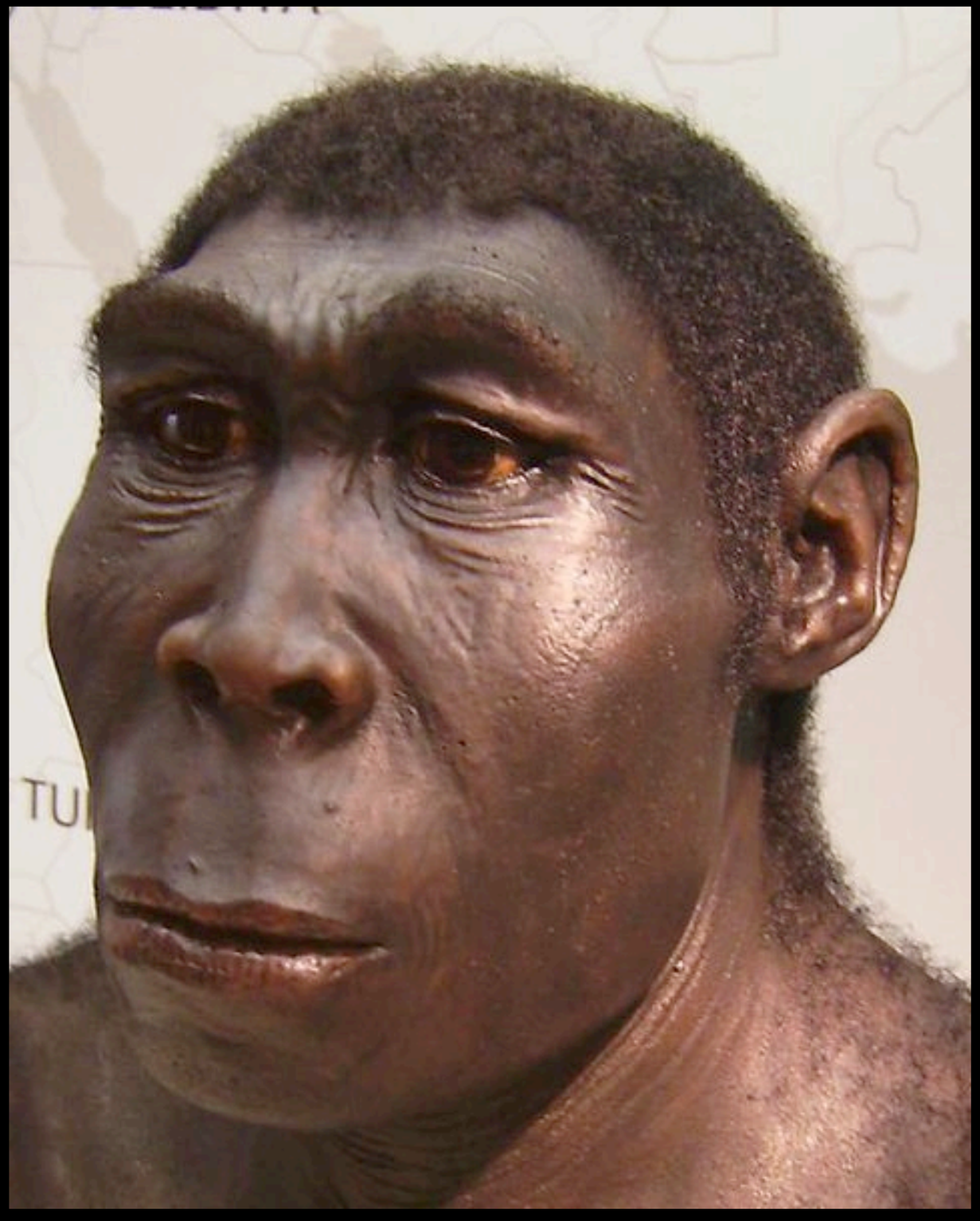


Homo ergaster (erectus)

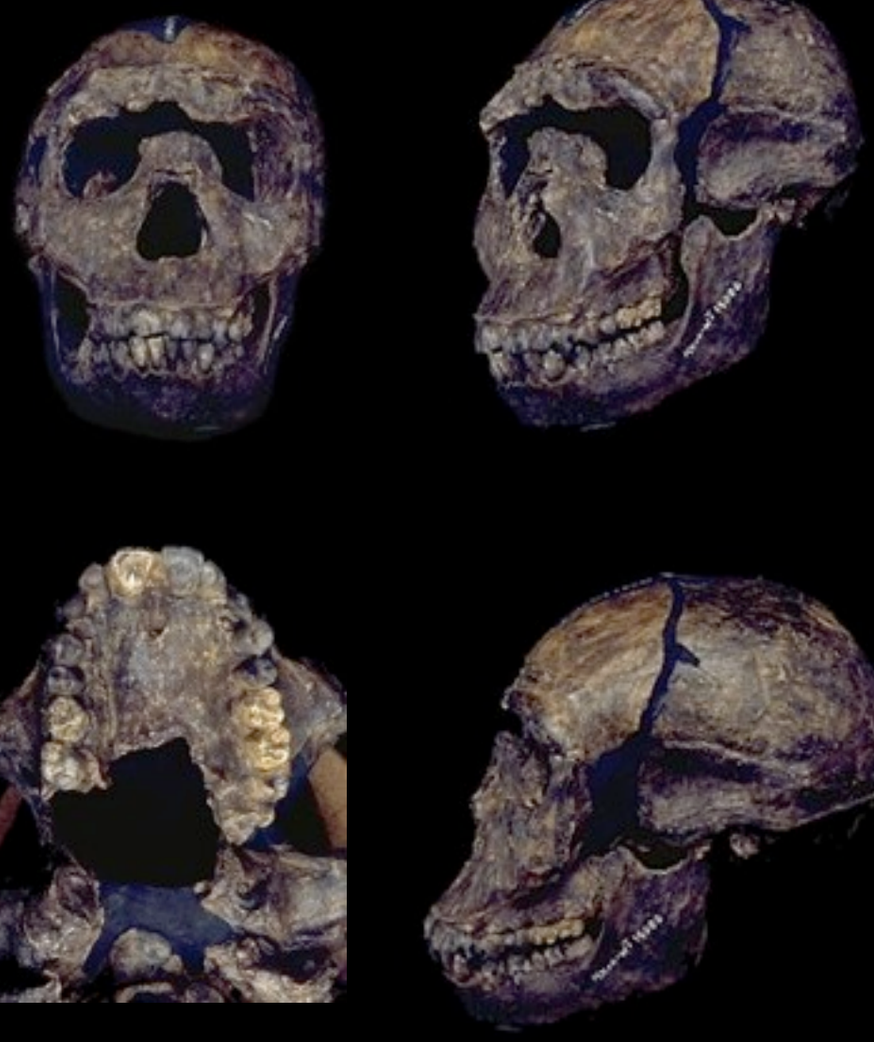
Homo habilis and *Homo ergaster*

Homo rudolfensis and *Homo erectus*

SKULLS
UNLIMITED
INTERNATIONAL



Homo ergaster



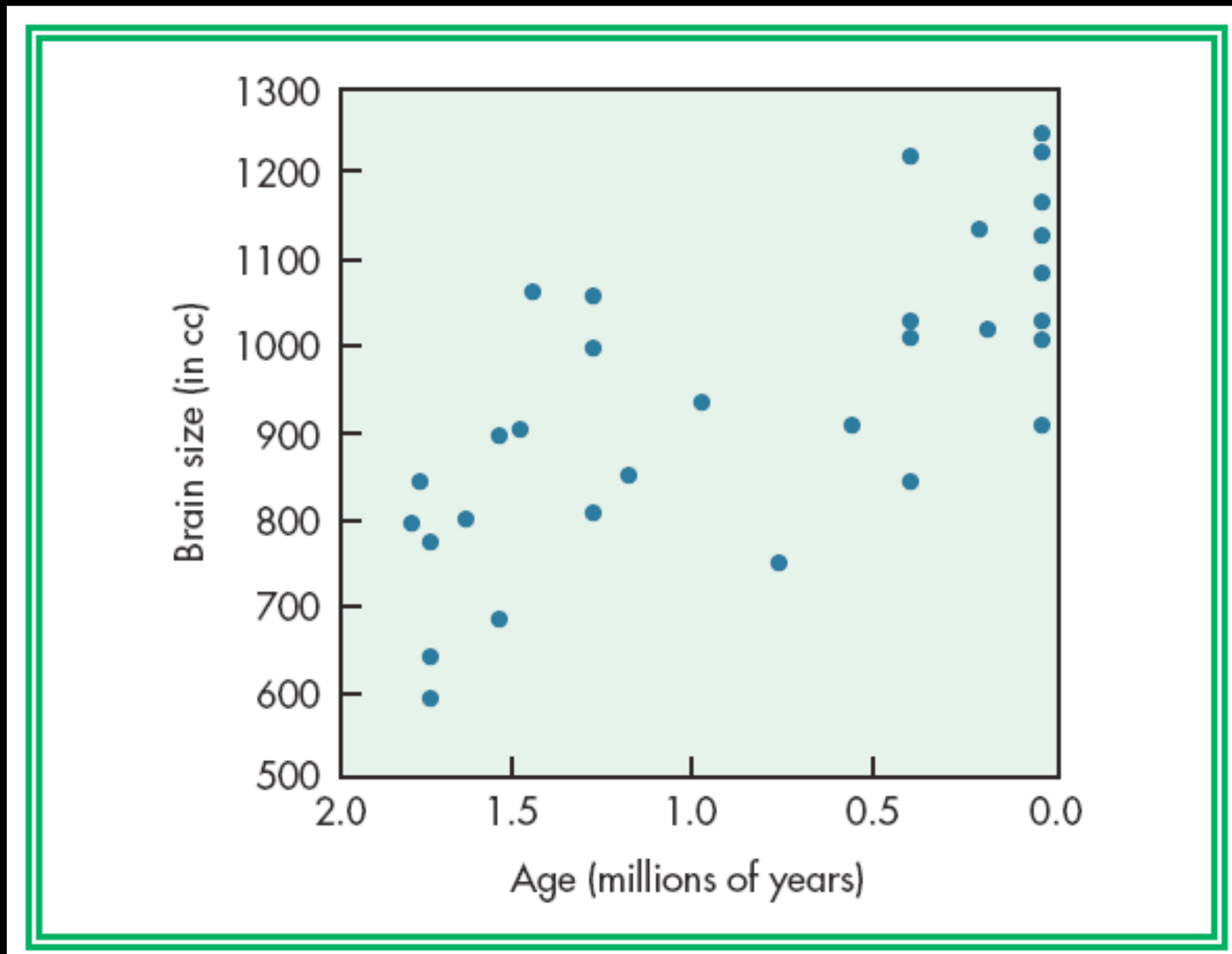
OH 9 - African *Homo erectus*
1.8-.8 mya

Homo erectus

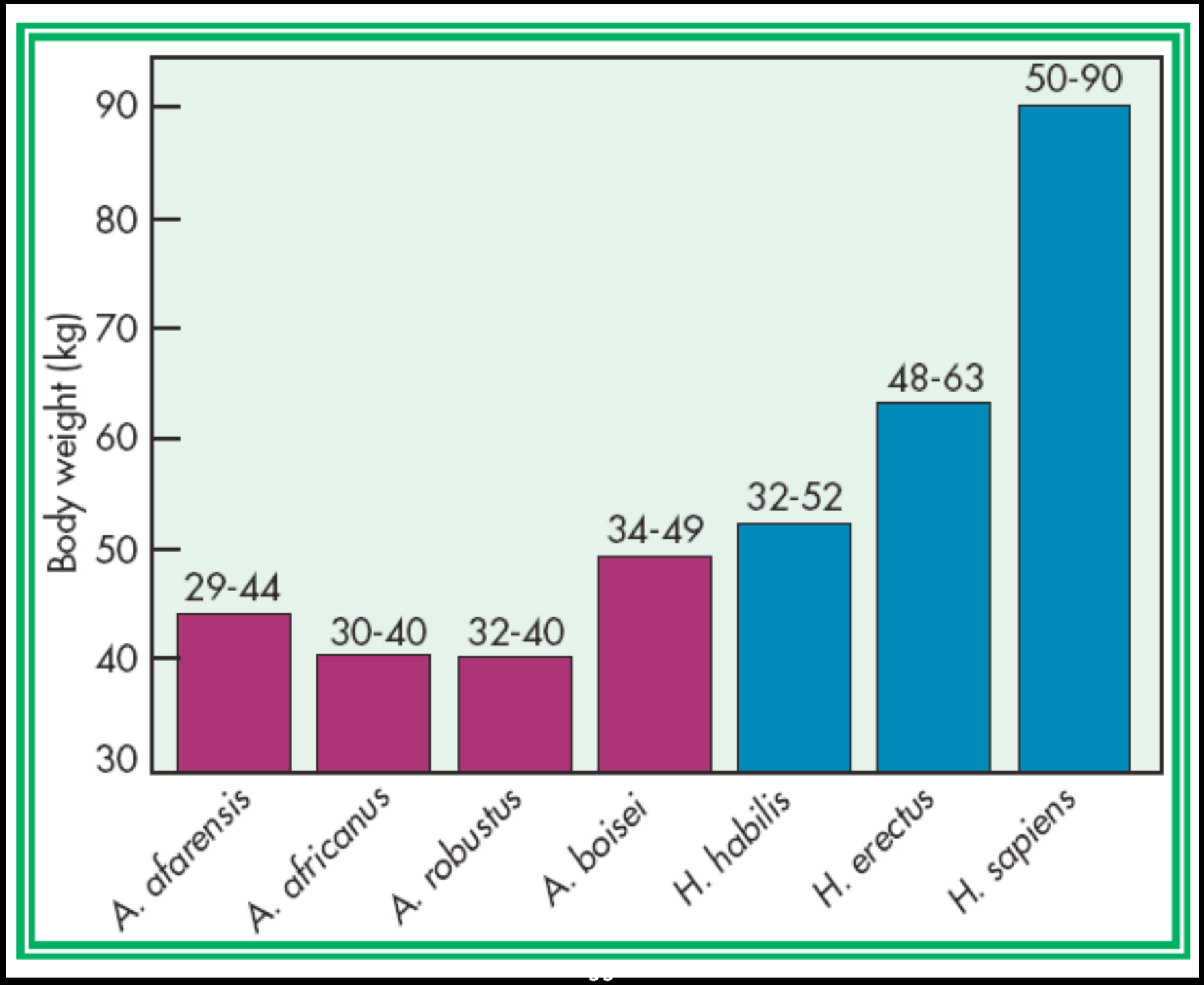
Changing adaptive pattern

- Expanding brain size
- Expanding home range
- Changing diet
- Changing metabolism
- Extended life span
- Changing social behavior?

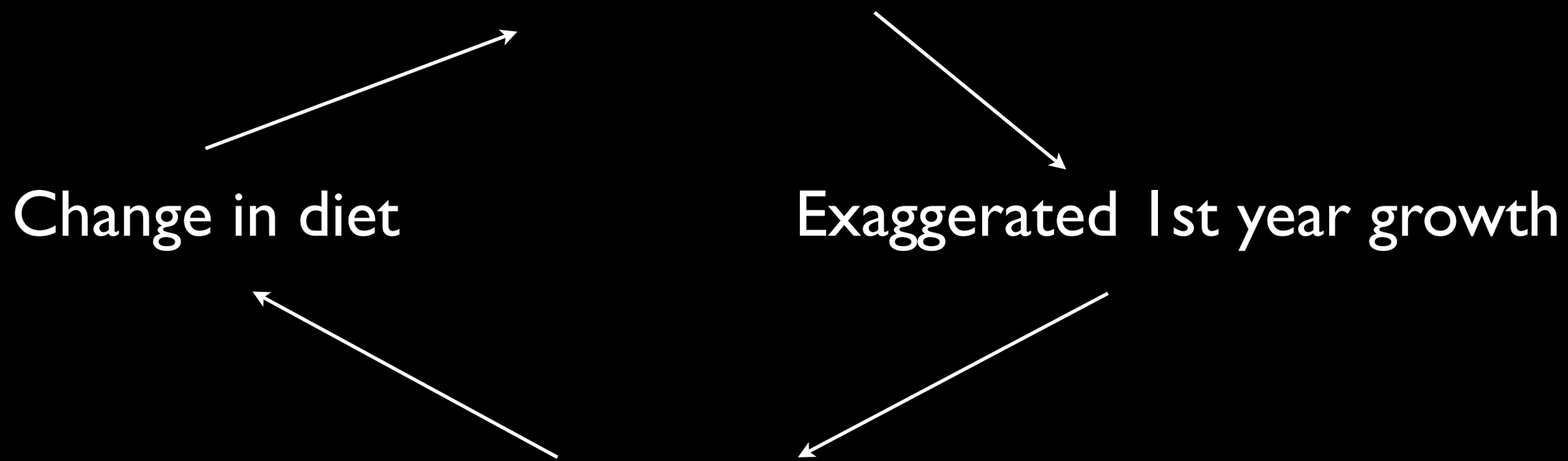
Brain size over time



Body size


Body weight (kg)
90
80
70
60
50
40
30
29-44
30-40
32-40
34-49
32-52
48-63
50-90
A. afarensis
A. africanus
A. robustus
A. boisei
H. habilis
H. erectus
H. sapiens

Feedback loop



Homo erectus lifeways

- tool technologies that reflect advanced cognitive skills
- Dietary shift to a more heavily meat-based diet than its predecessors

Atapuerca
Boxgrove
?
Salé
Ternifine
Dmanisi
Zhoukoudian
Lantian
Hexian
Turkana
Awash
Olduvai
Swartkrans
Java
Modjokerto
Sangiran
Trinil

Leave Africa?

- Predation?
- Technology?
- Migrating herds?
- Anatomical changes?

Dmanisi - *H. georgicus*

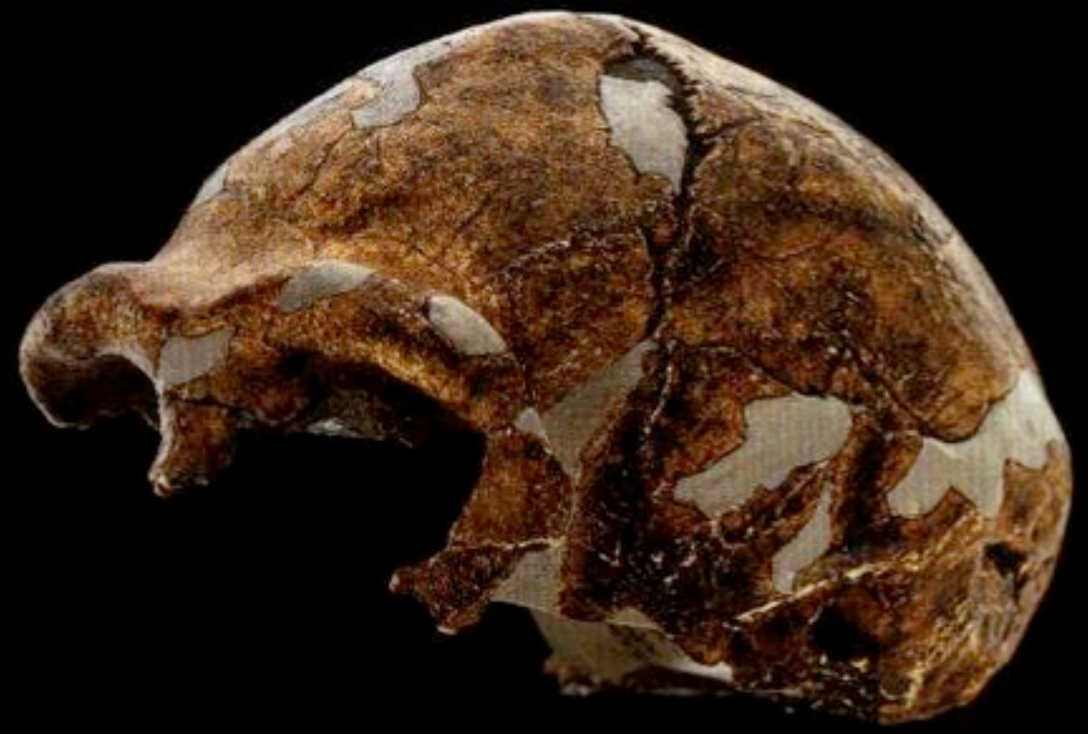
1.6-1.2 mya

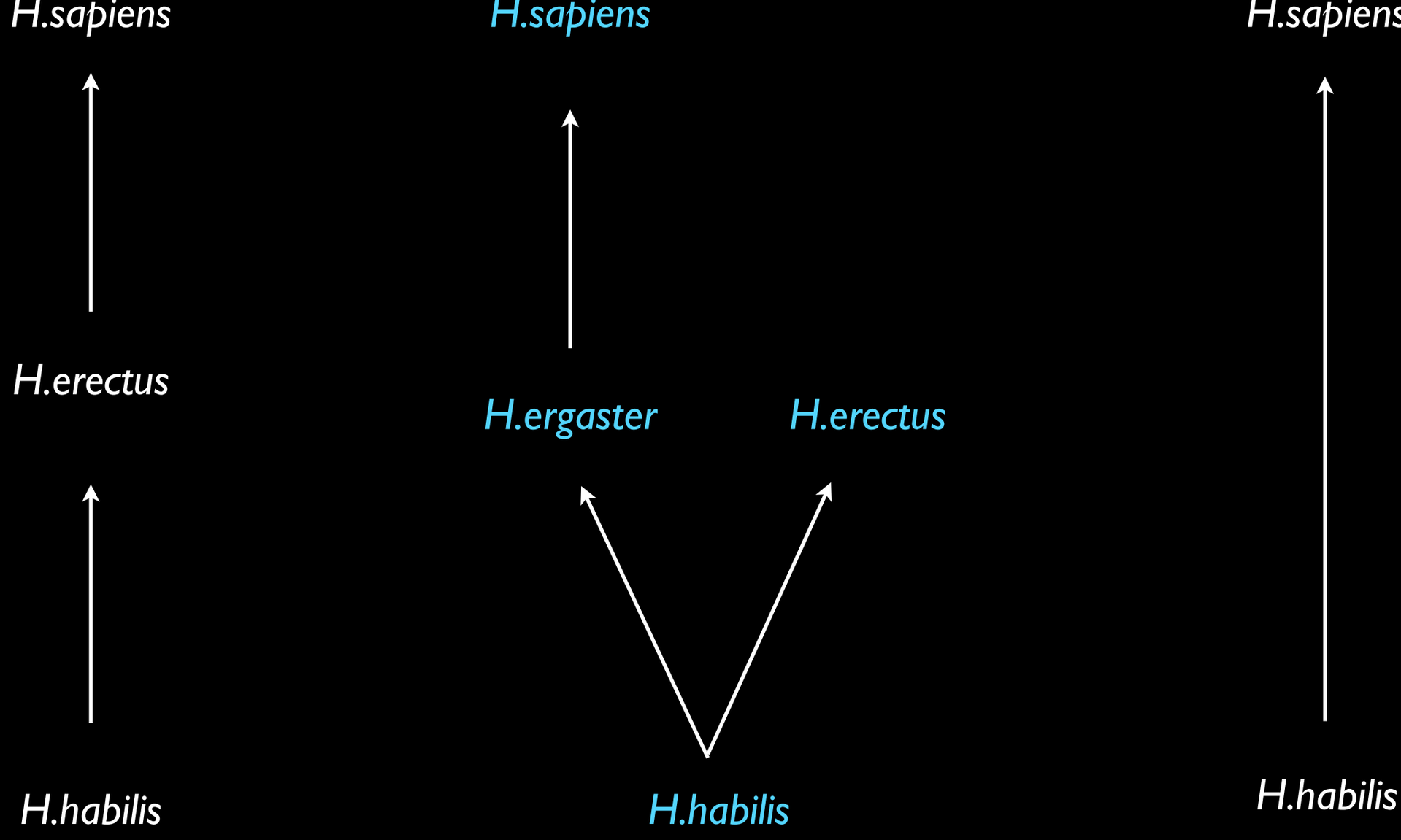
Dmanisi vs *A. sediba*

Javan *Homo erectus*
1.6-1.2 mya

Sangiran

Chinese *Homo erectus*
1.0-.3 mya



Lantian H. erectus
1.0 - 0.7 mya

How do you interpret the evolutionary record?