

EARLY HOMO



AUSTRALOPITHECUS AND PARANTHROPOUS TRENDS REVIEW

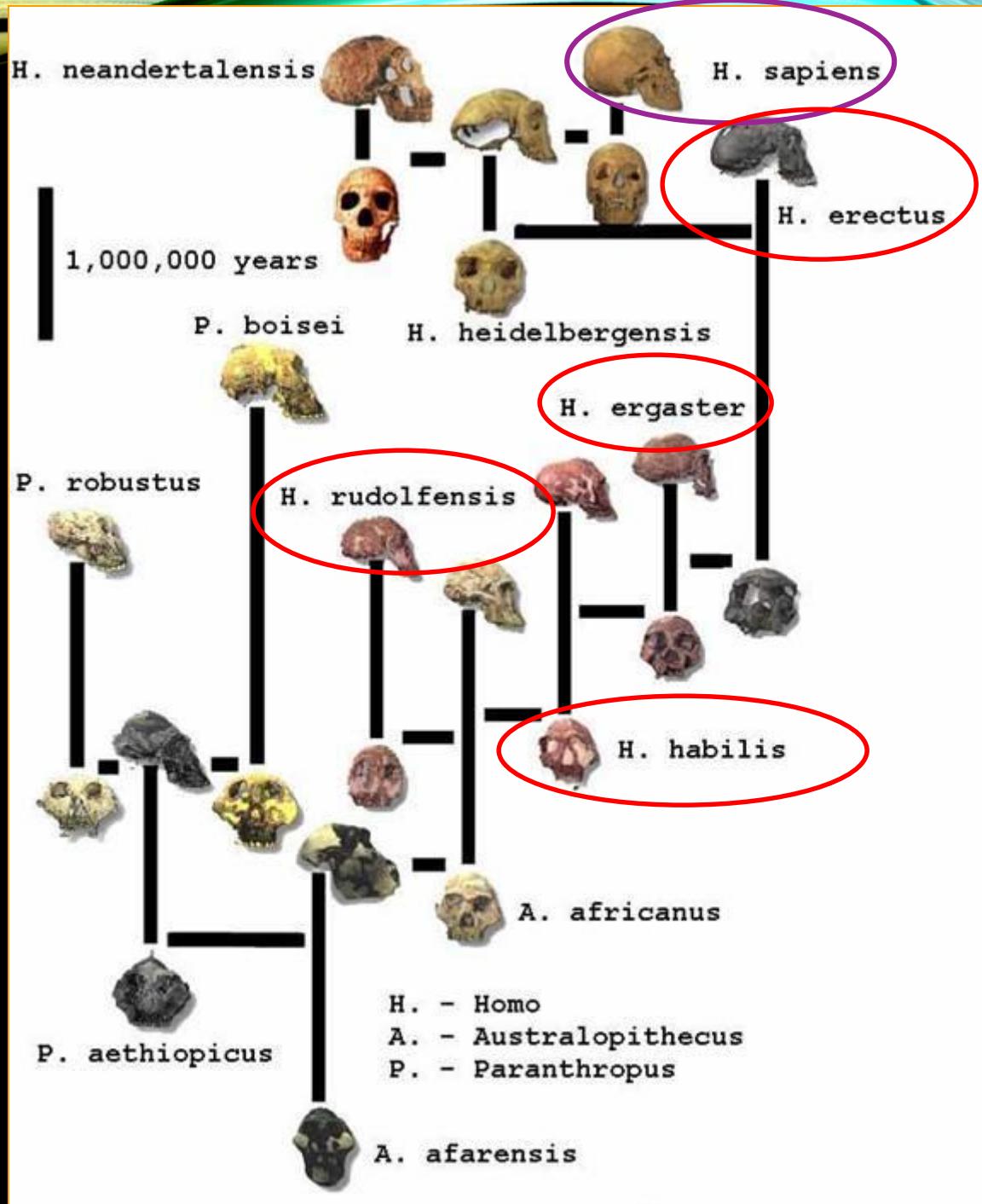
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- Slow increase in brain size
- Trend toward harder diet over time
- Possible stone tool use from 2.6 Mya

Hominin Family Tree

Early *Homo* species

Modern humans



EARLY HOMO

Some early *Homo* characteristics

- Larger brains than early hominins
- More sophisticated subsistence economy
- Teeth are smaller and have thinner enamel

HOMO HABILIS

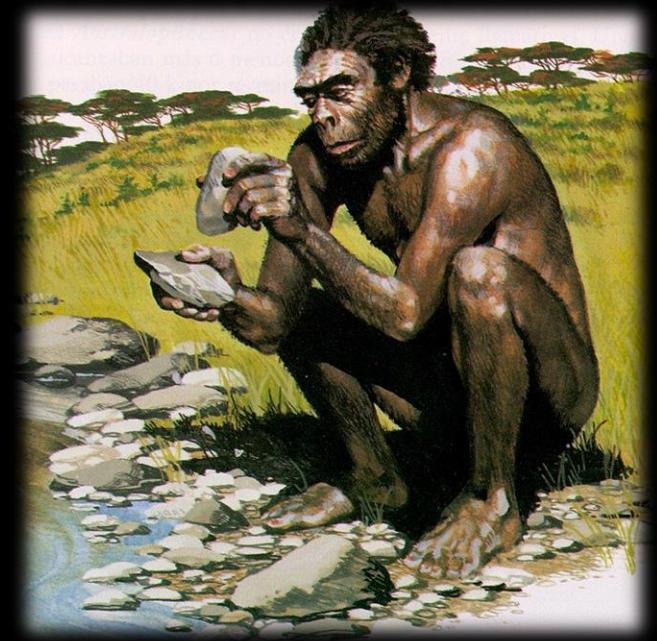
- Found in East & South Africa
 - 2.4 – 1.4 Mya
 - Height = 3'4" to 4'5"
 - Weight = 32 kg (~70 lbs)
- *H. habilis* may be on our own branch of the evolutionary tree



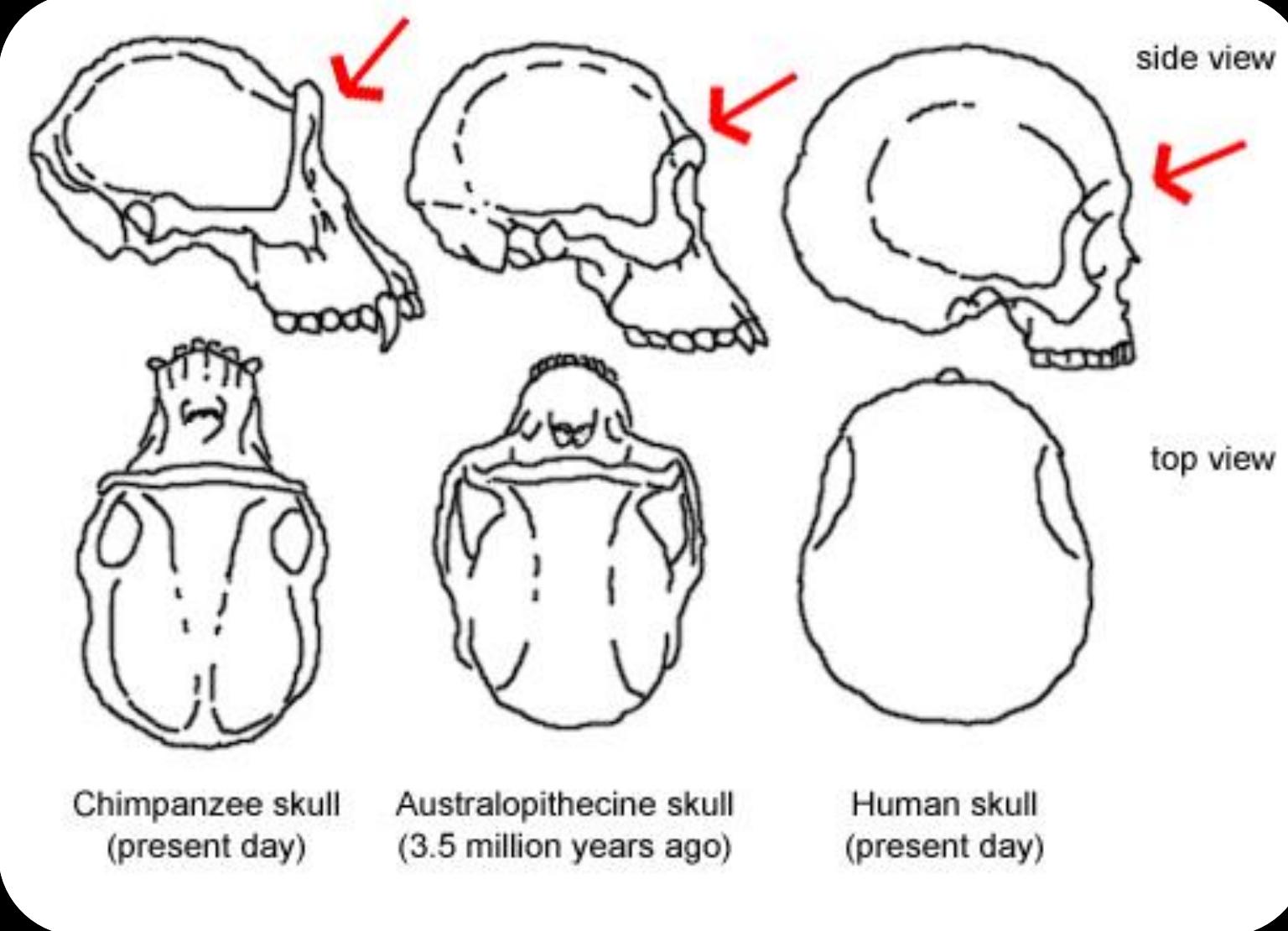
THE HOMININ BRAIN & STONE TOOLS

Pre-*Homo* Development

- First bone tool users were *Au. africanus*
- *Au. africanus* has more developed frontal lobe than earlier Australopiths
- Hominins after *Au. africanus* have an even more developed frontal lobe



FRONTAL LOBE DEVELOPMENT



TOOLMAKING AND INTELLIGENCE

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Kanzi the Bonobo

- Kanzi is an extremely intelligent ape with a particularly high aptitude for linguistics
- He was one of the apes featured in the film *Ape Genius*
- Scientists have also utilized Kanzi in experiments to test his capacity for stone tool making

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Kanzi Toolmaking Experiment

- Step 1: Kanzi is shown how sharp flakes can cut rope
- Step 2: Kanzi's favorite fruits were placed in a box and the box was tied with ropes
- Step 3: Kanzi was provided with many stone flakes to choose from

Result A: Kanzi learned to cut ropes to get at fruit

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Kanzi Toolmaking Experiment

- Step 4: Thicker ropes were used to close box

Result B: Kanzi learned how to identify the sharpest flake 90% of the time

- Step 5: Kanzi was shown how to make sharp flakes by hitting one rock against another

Result C: Kanzi learned to make crude flakes with a hammerstone

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Kanzi quickly got innovative

- learned to make flakes by smashing stone on concrete floor
- learned to throw one stone at another when outdoors



Neither of these techniques were shown to him

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Despite these innovations, Kanzi never managed to:

- Strike at the optimum angle to make the best flakes
- Make tools as refined as even the simplest Oldowan tools

Q: So what does all of this mean?

TOOLMAKING AND INTELLIGENCE

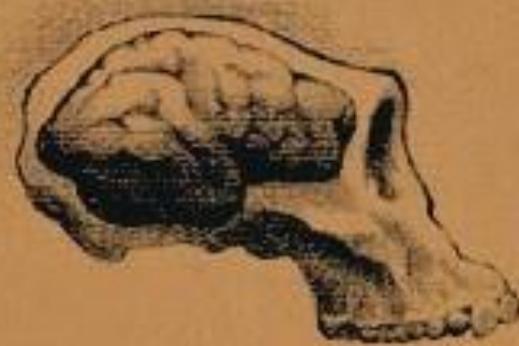
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The Kanzi toolmaking experiment is an example of experimental archaeology.

Why do we do experimental archaeology?

BRAIN SIZE COMPARISON

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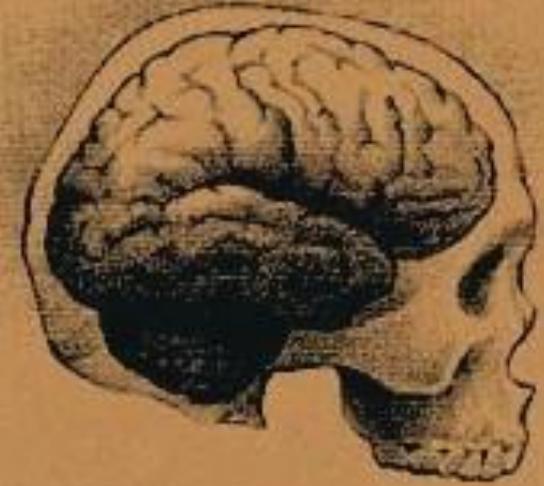
A. afarensis

450 cc



H. erectus

900 cc



H. sapiens

1350 cc

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Could Australopiths (including *Paranthropus*) have made tools?

- Australopiths from *Au. africanus* on have more developed frontal lobe of brain
- Brain size in Australopiths is larger than apes after 2.6 Mya (except *P. aethiopicus*)

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Could early *Homo* have made tools?

- Earliest member of the genus *Homo* (*H. habilis*) was found in same area with stone tools (2.3 Mya)
- *H. habilis* has larger brain (600 cc)
- *H. habilis'* brain also more human-like

EARLY HOMO BRAIN: MORE HUMAN-LIKE

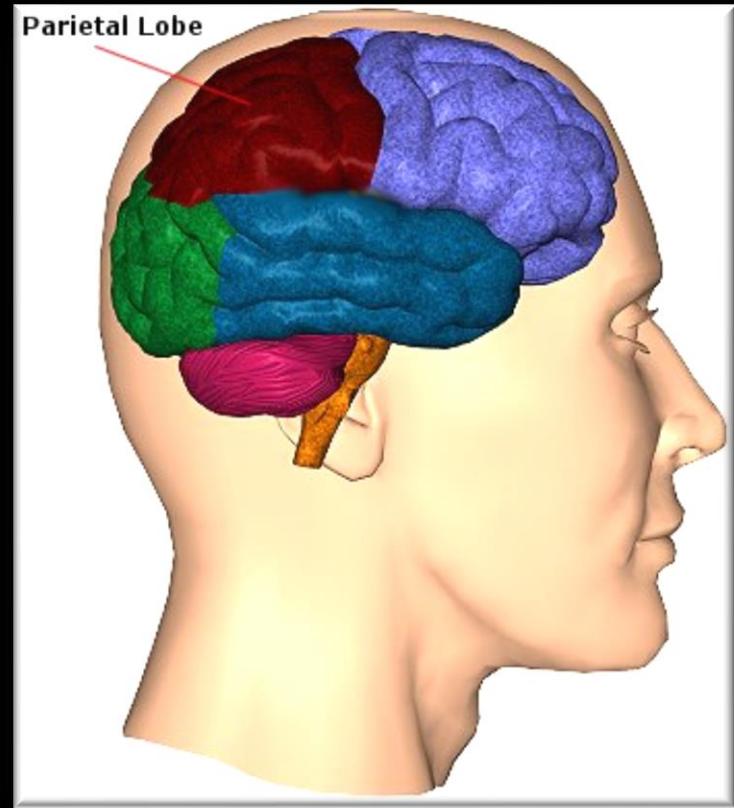
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- Endocasts show evidence of hemispherization
- Evidence of Broca's area in frontal lobe
- Evidence of Wernicke's area in parietal lobe

EARLY HOMO BRAIN: MORE HUMAN-LIKE

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- Parietal lobe accounts for most of the difference in brain size between Early *Homo* and modern humans
- Major differences in brain organization between *Au./P.* & Early *Homo*



ASSESSING BRAIN SIZE

With early *Homo*, body size increases

Species

- *Au. afarensis*
- *Au. africanus*
- *P. boisei/robustus*
- *H. habilis*
- Modern Humans

Brain/Body Ratio

- 280 cc/meter
- 350 cc/meter
- 380 cc/meter
- 575 cc/meter
- 850 cc/meter

EARLY HOMO ANATOMY

Australopithecus/Paranthropus

- Bipedal
- Smaller Brain
- Large Teeth
- More Robust Face
- Molar 3 > M2 > M1

Early Homo

- More Efficient Bipedalism
- Larger Brain
- Smaller Teeth
- Gracile Face
- Molar 1 > M2 > M3

EARLY HOMO: TOOL USE

What were early members of the genus *Homo* using tools for?

- Processing meat
- Cutting natural materials
- Something else?

Man the Hunter?

- Meat eating = hunting(?)
- More recent evidence suggests that the Oldowan toolmakers acquired at least some of their meat through scavenging



ACQUIRING MEAT ON THE SAVANNA

Scavenging

- many animals live on savanna
 - killed by large predators
 - die naturally during dry season
- tools can be used to “cut and run”



ACQUIRING MEAT ON THE SAVANNA

Scavenging

- listening to “kill calls” from predators
- watching the skies for vultures
- learning locations of leopard feeding trees



EVIDENCE OF SCAVENGING

- Cutmarks are often on bones from less meaty parts
- Tool cutmarks found superimposed over animal tooth marks
- Animal leg bones smashed to extract marrow

EVIDENCE OF SCAVENGING



Bone Marrow
(from modern deer)

SCAVENGING VERSUS HUNTING DEBATE

Pro-hunting:

- Taphonomic evidence that might suggest hominins had first access to carcasses
- Even chimps hunt small game

Pro-scavenging:

- Oldowan toolmakers were too small, too poorly armed, and did not have the cognitive capacity to be large game hunters
- Taphonomic evidence for scavenging

THE SEARCH FOR AN ANCESTOR

Of the various species discussed in the last few lectures, which are on the same branch of the evolutionary tree as Early *Homo*?

- Early *Homo* found first in East Africa
- Uncertainty about relationships between:
 - *Au. afarensis*
 - *Au. africanus*
 - *Au. garhi*

THE SEARCH FOR AN ANCESTOR

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- *Au. garhi* was probably an ancestor to Early *Homo*
- *Au. garhi* has been nicknamed the “first engineer”

