

ANTHROPOLOGY 202 October 1, 2014

An Introduction to World Prehistory

IV. The Beginning: Africa

- B. The Fossil record (*Pre-Homo*)**
- C. The Artifact Record**
- D. Lifeways**
- E. Early Homo**

V. Out of Africa: Middle *Homo*

WELCOME BACK BBQ SOCIAL SCIENCES STUDENTS

FRIDAY OCTOBER 4 5:00-7:30 PM

**Dr. Keese's BEACH HOUSE, 234 Front
Street
Avila Beach**

**Directions and SIGN-UP In Department
Office Building 47 Room 13**

ANT 202 Wednesday October 1, 2014

**STUDENTS WITH LAST NAMES L-R
PLEASE
STAY FOR A DEMONSTRATION
AT THE END OF CLASS**

ALL OTHER STUDENTS WILL BE DISMISSED

10-15 minutes Early!!

Walking like a Human

Chimps can walk on two legs, but with a gait that is awkward and precarious. That's largely because their heads and torsos are thrust forward, not balanced over the hips and legs. Humans have evolved to correct that imbalance.

① SPINE

A chimp's lumbar region, or lower spine, is short and stiff; a human's is longer and curved to push the torso's center of gravity forward so that it lies over the feet.

② PELVIS

Chimps sway when they walk upright because lifting one leg off the ground throws them off balance; humans prevent such swaying with a broader pelvis and a specialized hip joint and its associated muscles.

③ THIGHBONE

In chimps, the femur runs straight from hip to knee. The human femur angles inward, moving support more directly under the torso.

④ KNEE JOINT

To support the human body's weight, the femur is larger at the bottom and the tibia is larger at the top. A groove at the bottom of the inward-angled femur keeps the patella from sliding off.

⑤ FOOT

A chimp's big toe is opposable, like a thumb, allowing the chimp to grasp with its foot. A human's big toe is lined up with the other four toes—bad for climbing but good for forming an arch that runs from front to back. The arch acts as a shock absorber, deflecting impacts that would otherwise travel up the leg. This enables humans to walk long distances and run with less chance of injury.

Opposable big toe



Chimpanzee foot

Human foot

Heel elevation is low



No arch

Chimpanzee foot when walking

Heel elevation is high



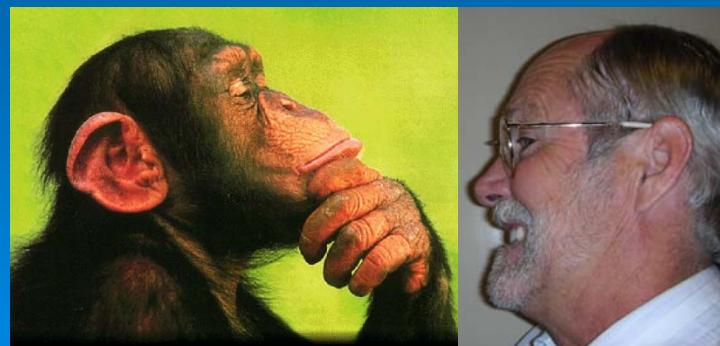
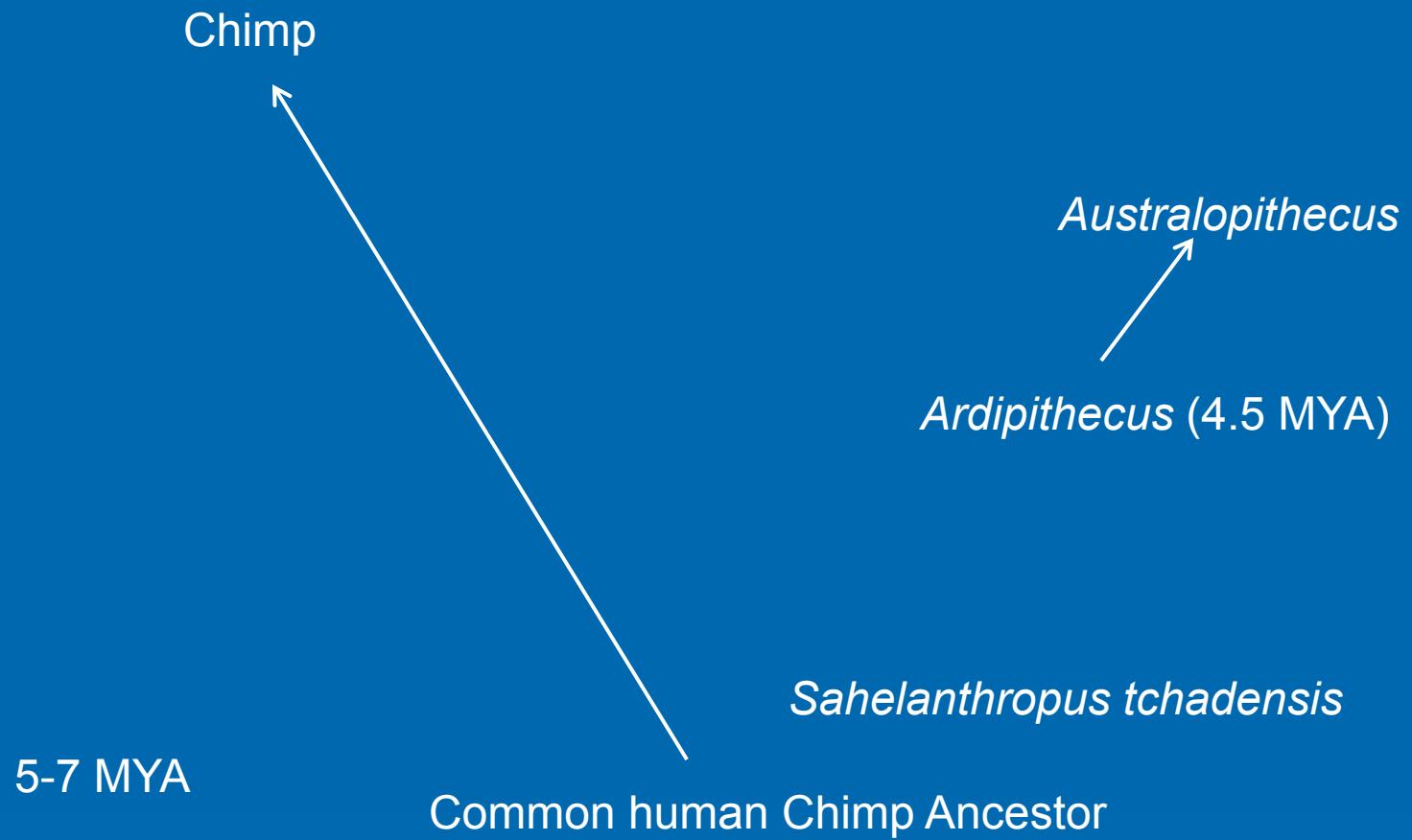
Arch

Human foot when walking



Sources:
Princeton University,
American Museum of
Natural History

TIME Graphics
by E. O'Neal



Hominidae Family

Sahelanthropus tchadensis 6-7 MYA



Cranial Capacity:

Modern Chimp 350-400 cc

Modern Human 1400 cc

A Simplified Phylogeny of Early Hominins

MYA

0

1

2

3

4

5

6

7



Sahelanthropus tchadensis

A Simplified Phylogeny of Early Hominins

MYA

0

1

2

3

4

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6

7



Ardipithecus ramidus
“Ardi”

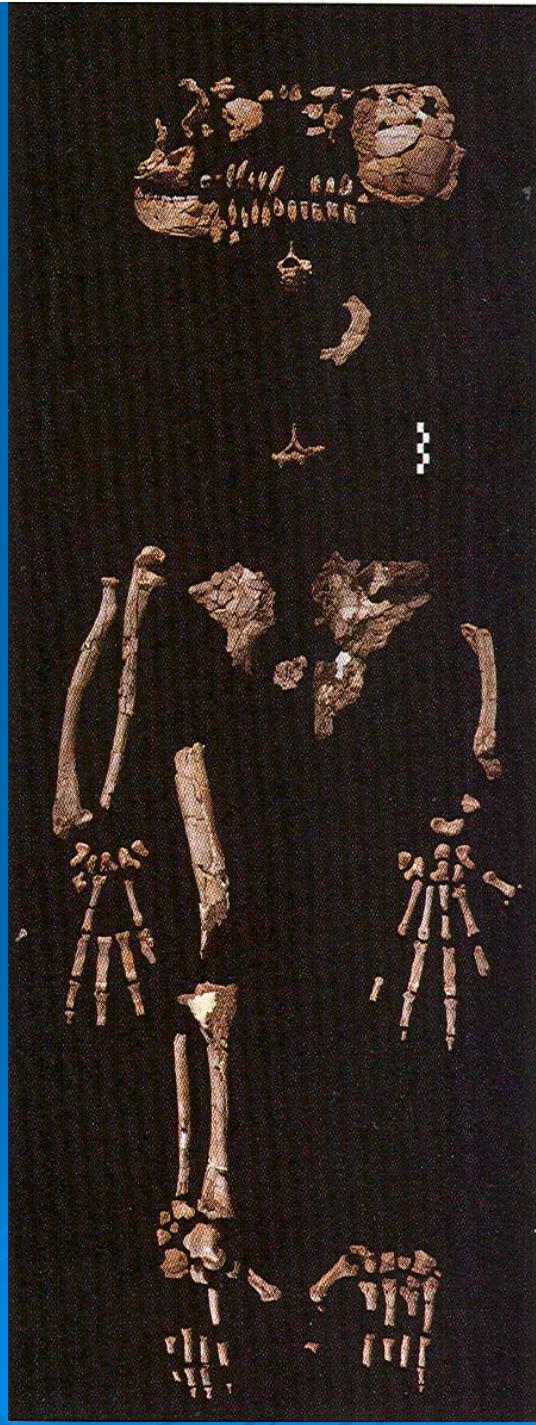


Sahelanthropus tchadensis

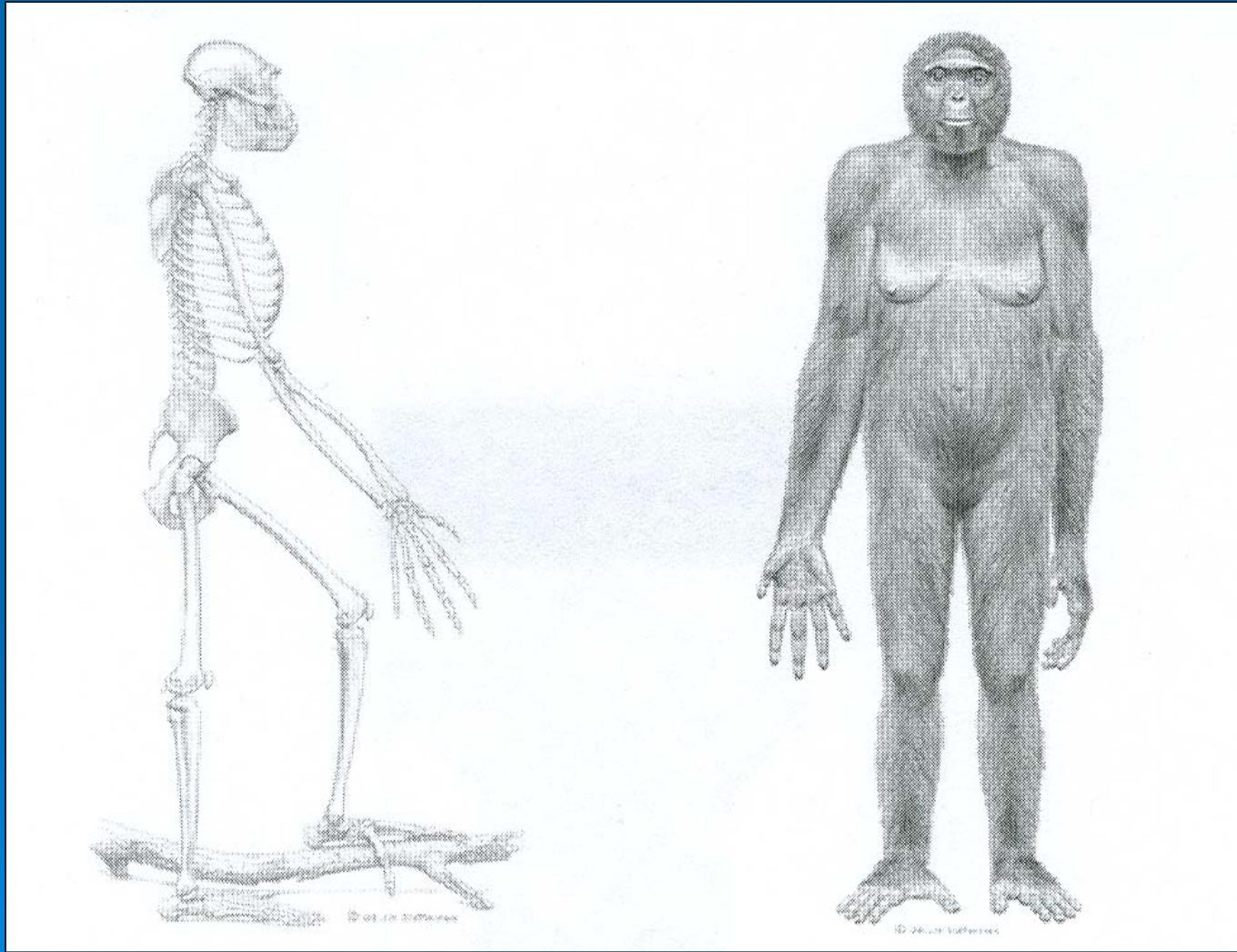


**Woman of the Year 2009 *Ardipithecus ramidus*
or “Ardi”**

*Ardipithecus
ramidus*
4.4 MYA



Artist's Reconstruction *Ardipithecus ramidus* or "Ardi" 4.4 MYA



“Ardi” discovered by Tim White, UC Berkeley



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Arch

Human foot when walking



Sources:
Princeton University,
American Museum of
Natural History

TIME

Graphic by
E. O'Neal





A Simplified Phylogeny of Early Hominins

MYA

0

1

2

3

4

5

6

7



Ardipithecus ramidus
“Ardi”



Sahelanthropus tchadensis

A Simplified Phylogeny of Early Hominins

MYA

0

1

2

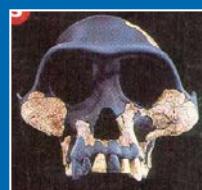
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Australopithecus afarensis
“Lucy”

Ardipithecus ramidus
“Ardi”

Sahelanthropus tchadensis

Defining traits of *Australopithecus*:

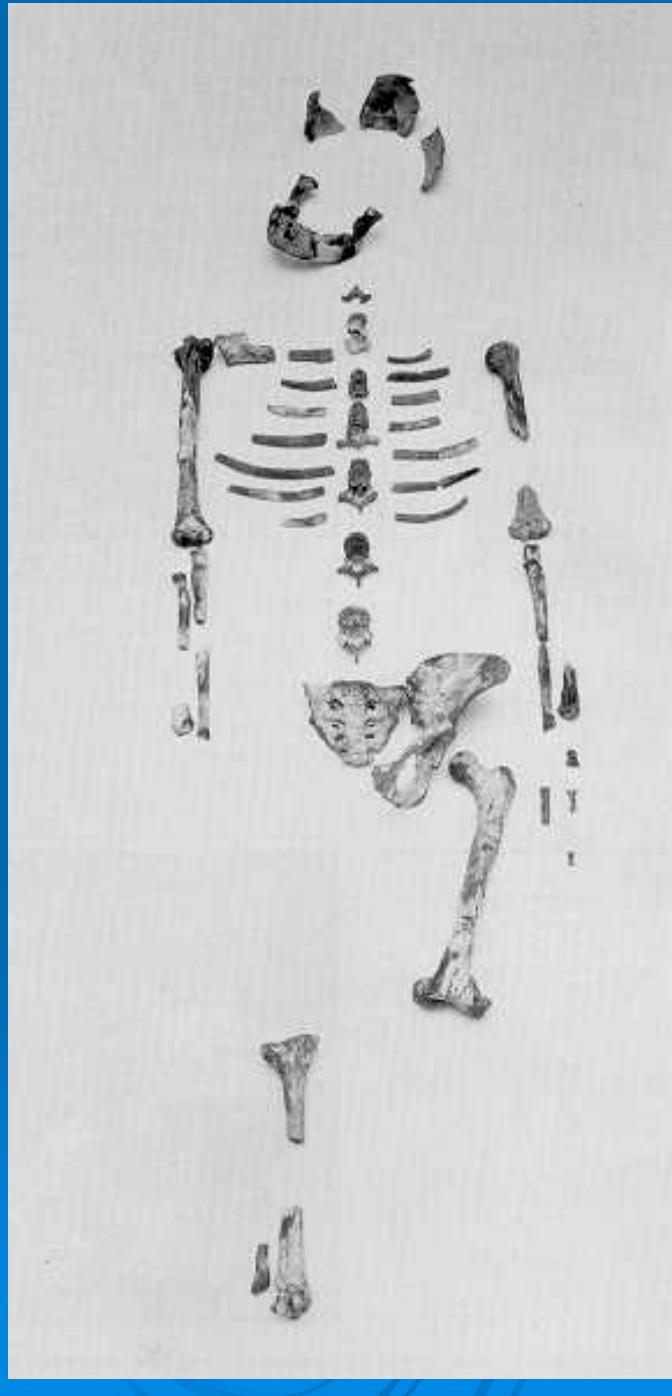
Bipedalism

Small brains

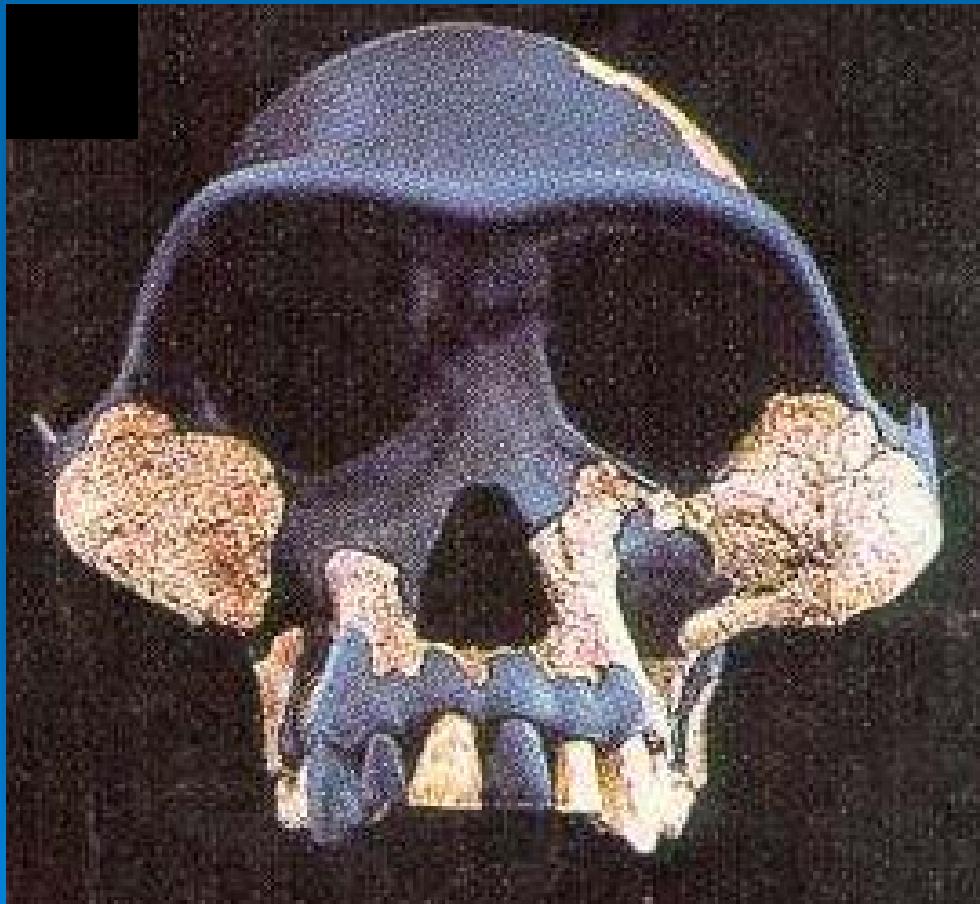
Large cheek teeth



A. afarensis
or
“Lucy”



Australopithecus afarensis best represented
by “Lucy” 3.2 MYA



(a) Size variation

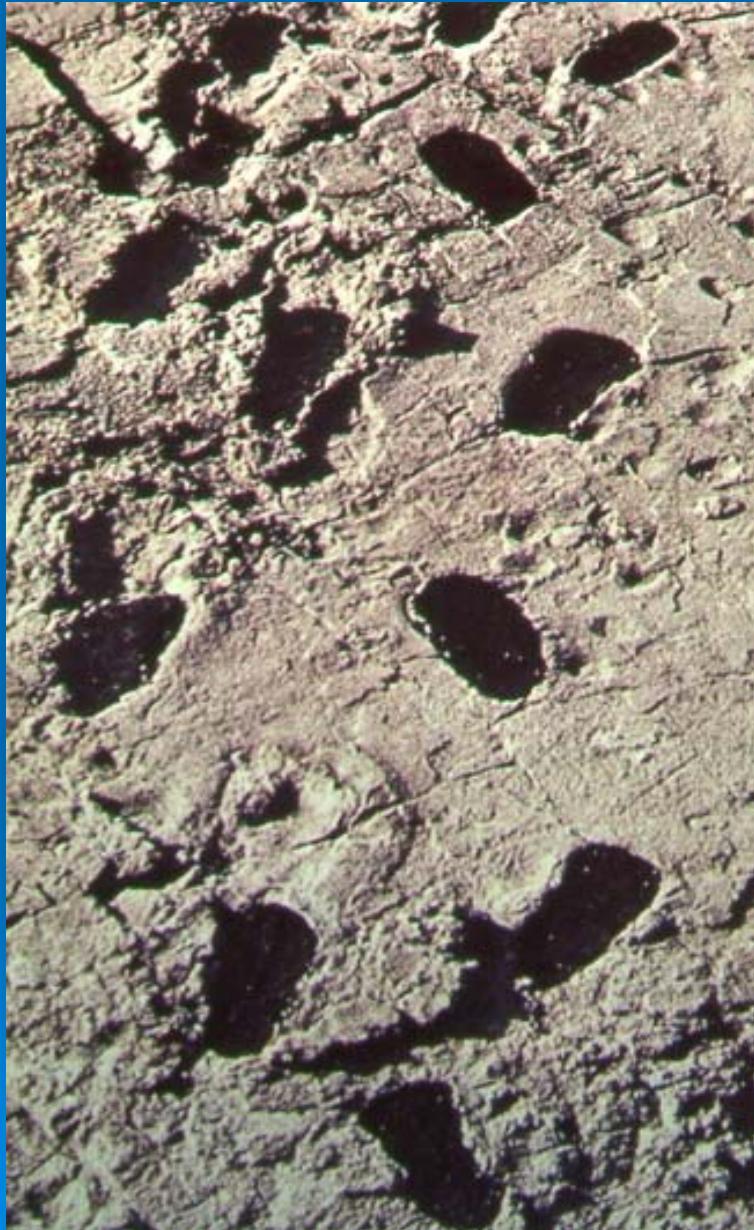
(b) Bipedal

(c) Prognathic

(d) Chimp-like brain

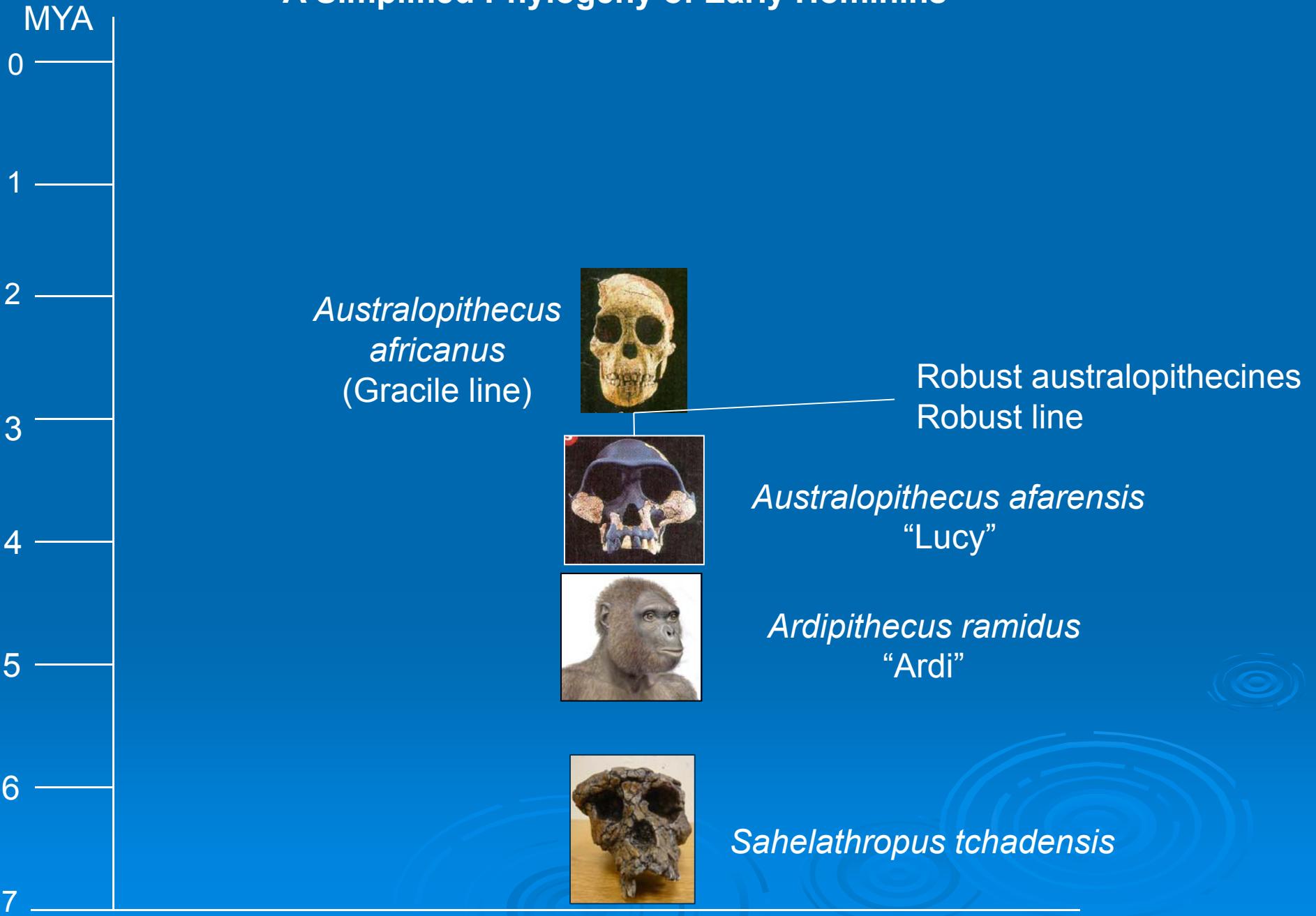
(e) No tools

Hominin footprints at Laetoli 3.5 MYA

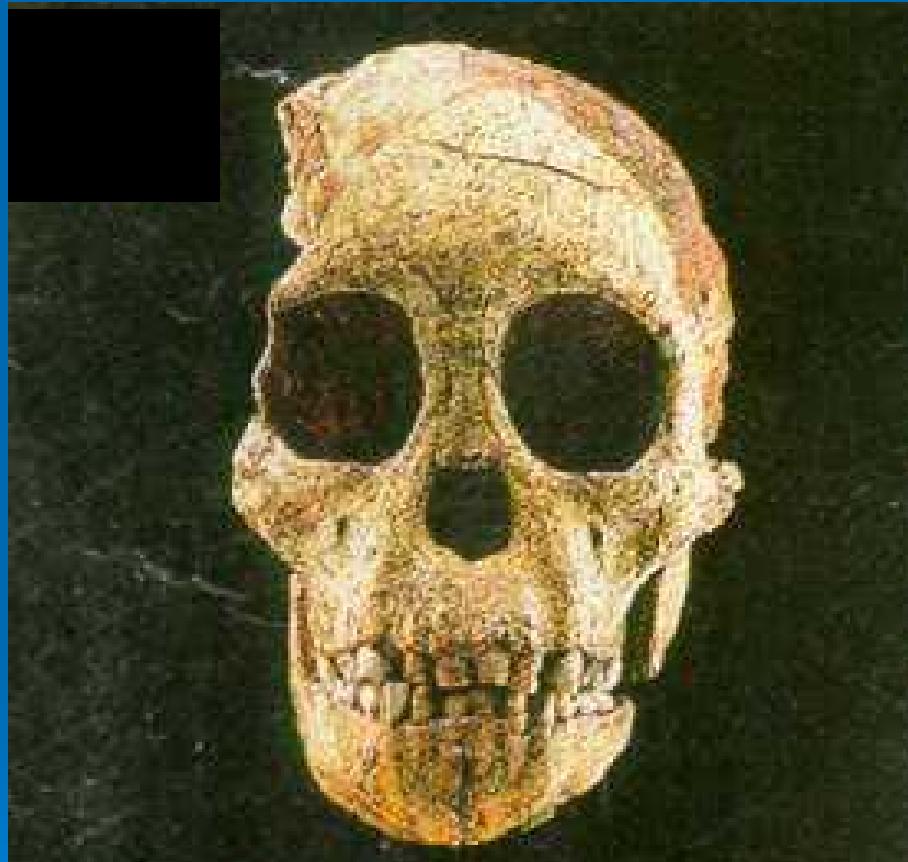




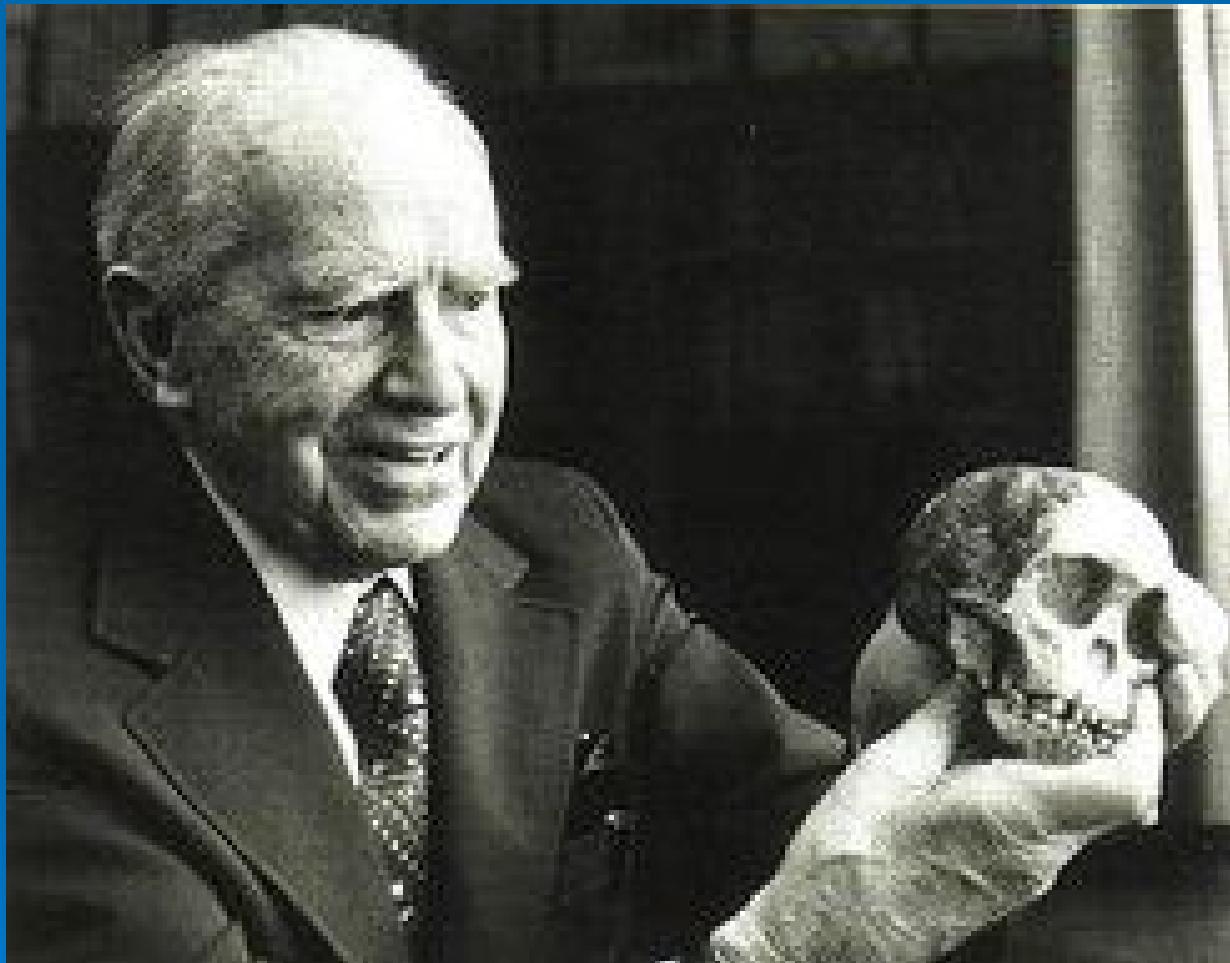
A Simplified Phylogeny of Early Hominins



Australopithecus africanus 3.0-2.5 MYA
best represented by the Taung Baby
from South Africa



Raymond Dart with the “Taung Baby” Fossil



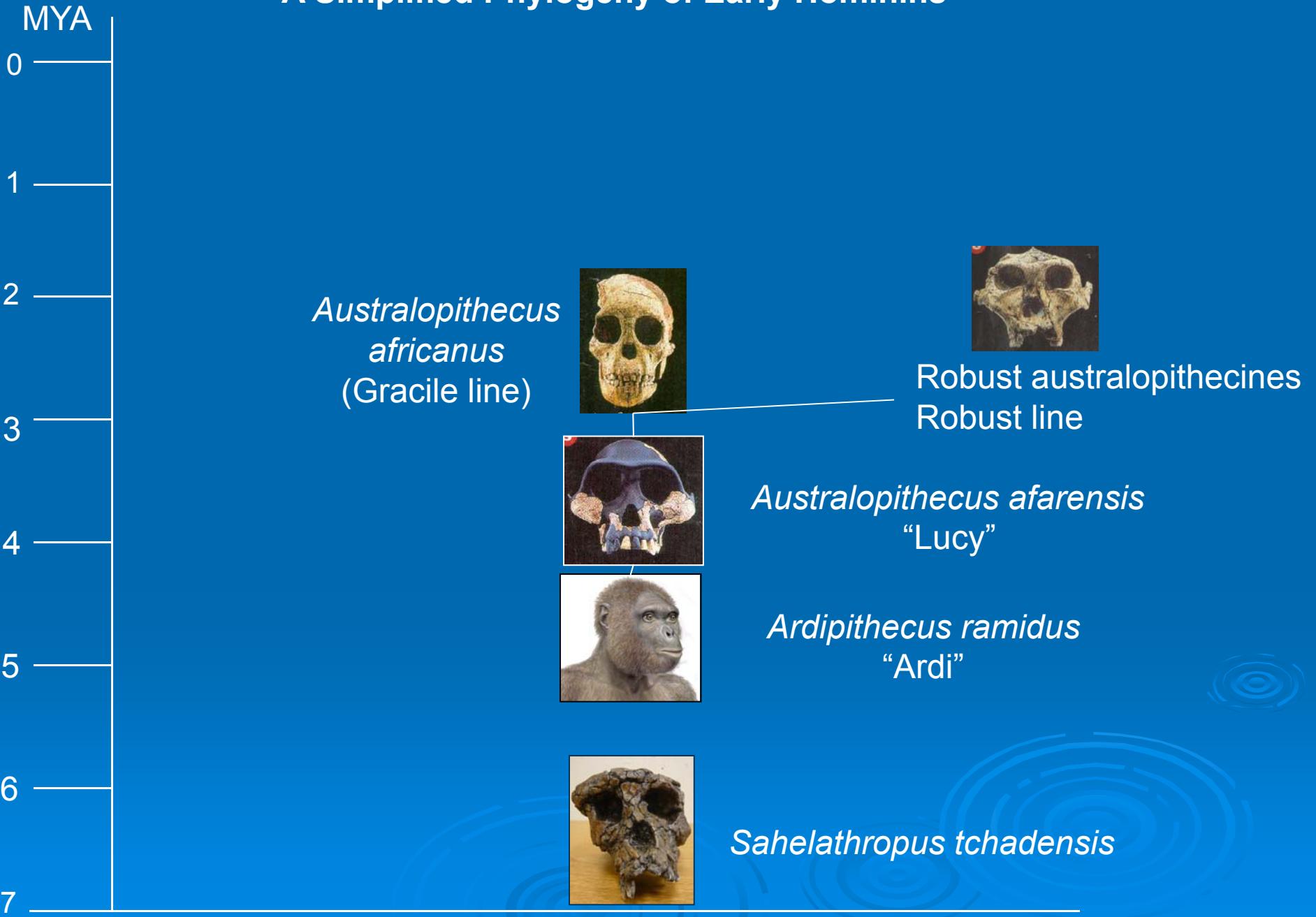
Australopithecus africanus 3.0-2.5 MYA
best represented by the Taung Baby
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The Piltdown Hoax: Greatest Scientific Fraud of the 20th century?



A Simplified Phylogeny of Early Hominins



Louis and Mary Leakey Early 1960s Africa



Robust Australopithecines 3-1 MYA



Robust Australopithecine



Gracile line

A. africanus

3.0-2.5 mya

Slightly larger brain 435-530 cc

Less prognathic

Large molars

Robust Line

A. boisei

3.0-1.0 mya

500-530

Large molars

Sagittal crest

Australopithecus garhi 2.5 MYA: at Kada Gona,
Ethiopia Found by Tim White The first tool user?



So what's this? I asked for a *hammer!* A hammer! *This* is a crescent wrench!... Well, maybe it's a hammer...
Damn these stone tools.”



Terms related to early Stone Tools:

Core: The objective piece (The piece that is struck)

Flake: Thin piece that is removed

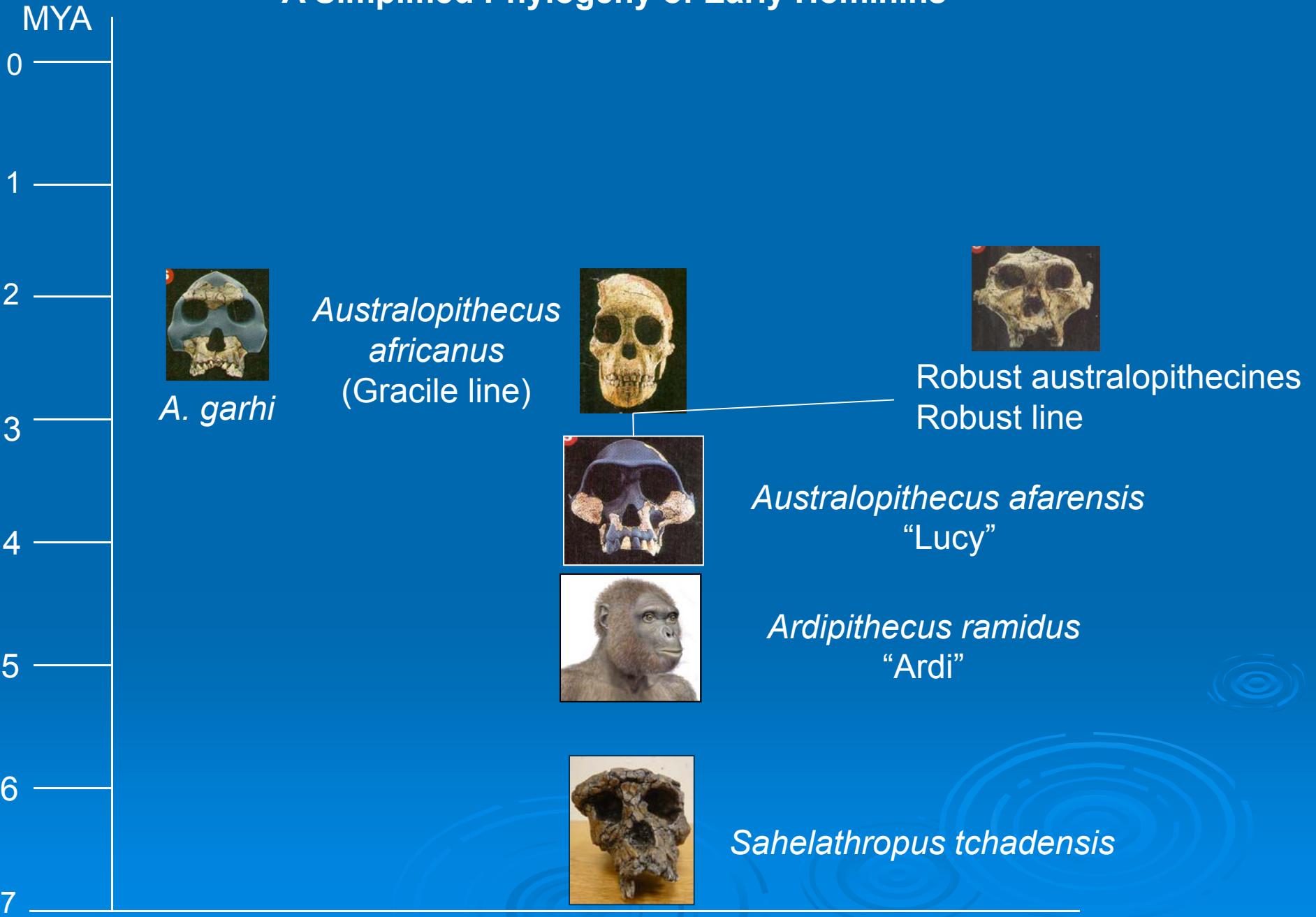
Hammerstone: The stone used to hammer

Pebble Tool: Pebble from which two or three flakes were removed to make a tool

Oldowan Tool: Pebble Tools like those found at Olduvai Gorge and near *Australopithecus garhi*

Basal Paleolithic: 2.5-1.8 MYA Period marked by Oldowan tools and flakes

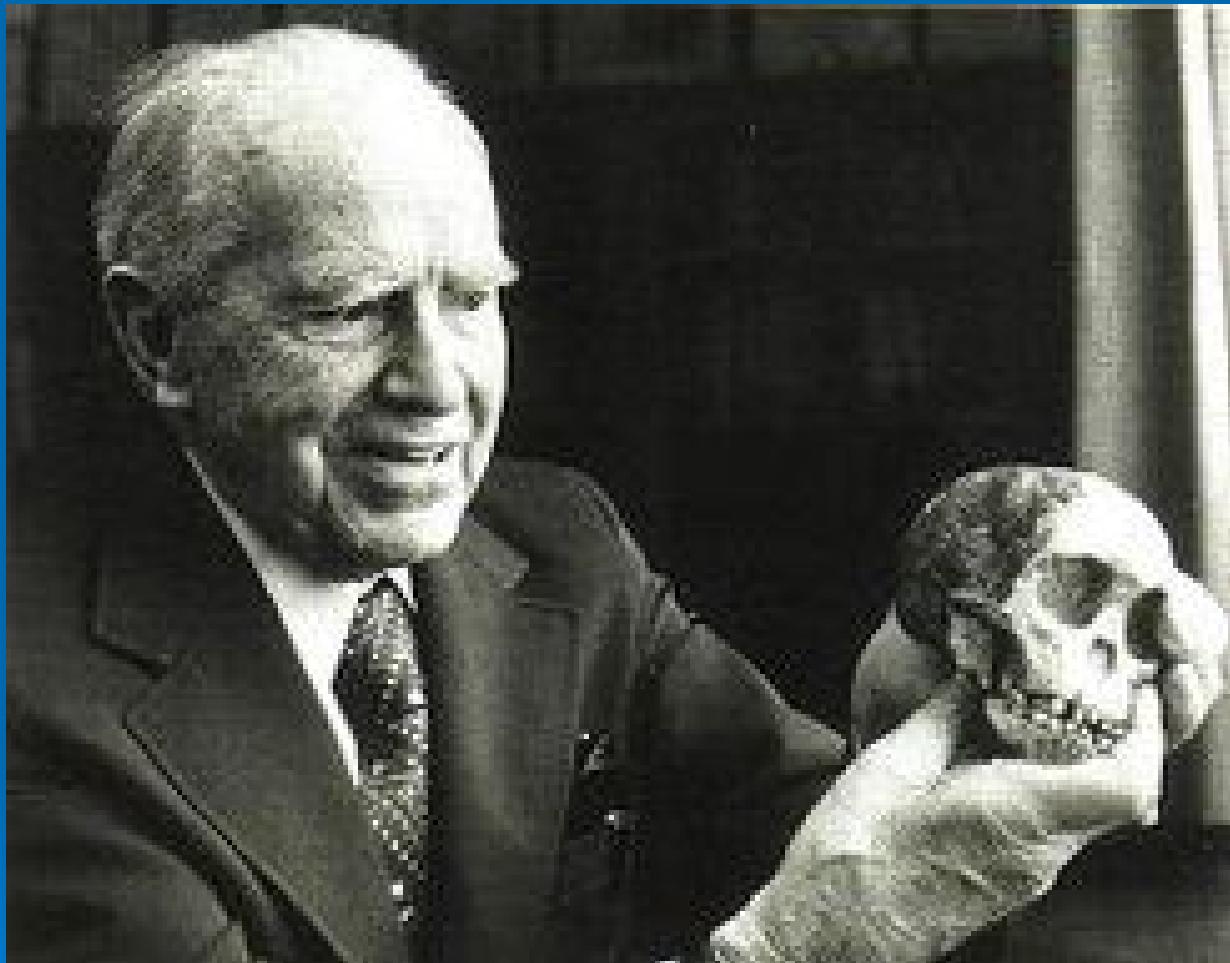
A Simplified Phylogeny of Early Hominins

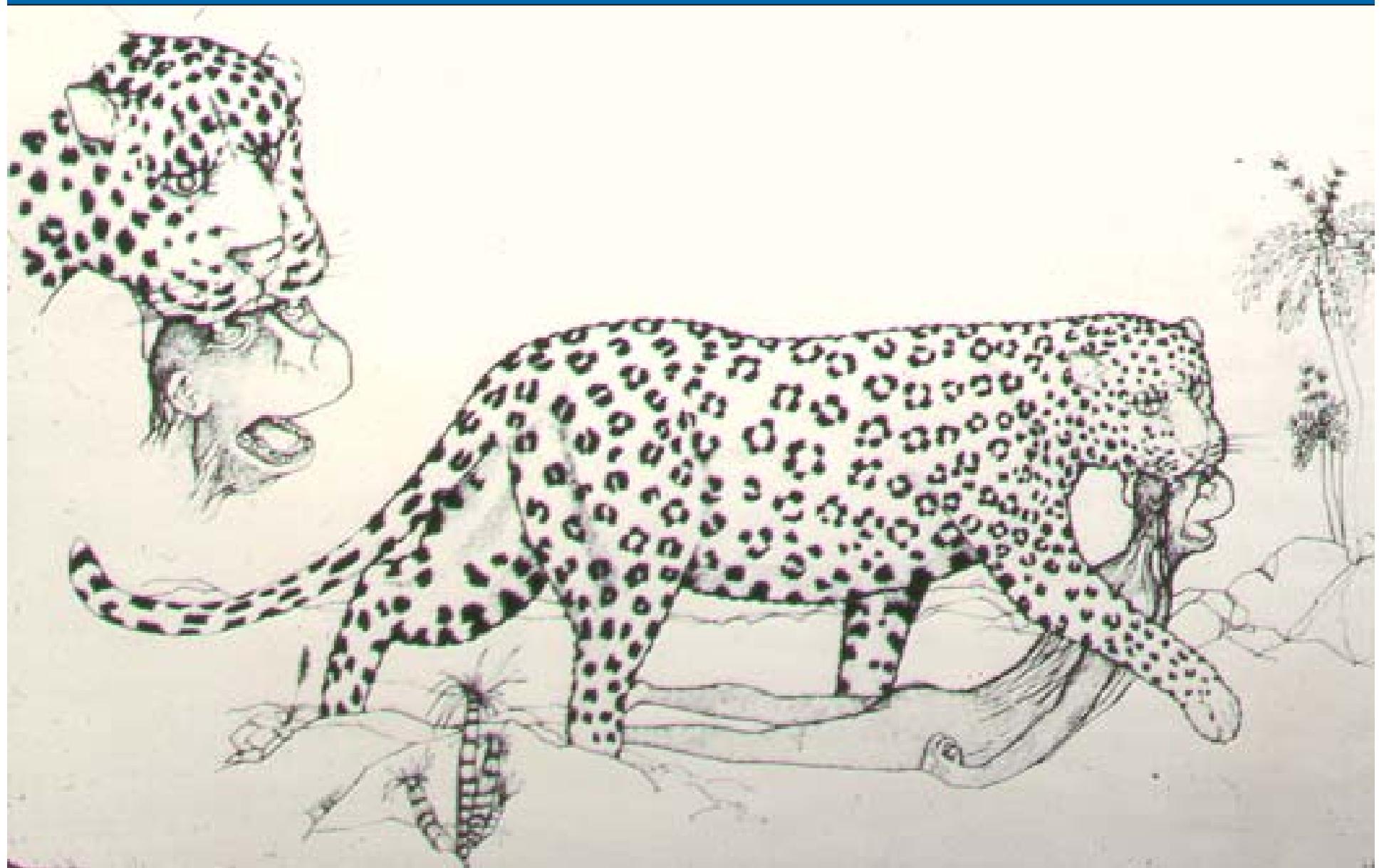


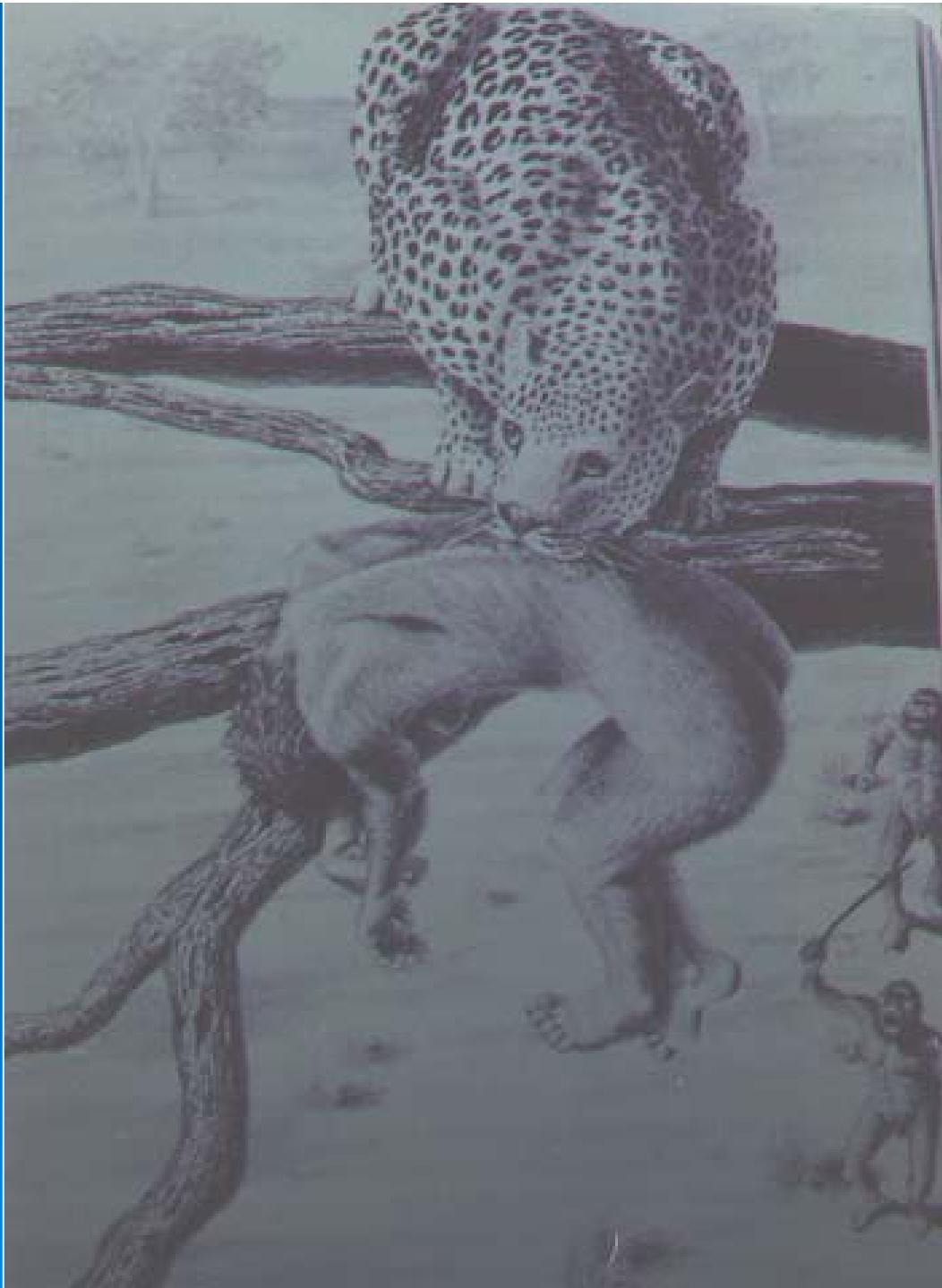
Early hominins: Hunters or Scavengers?



Raymond Dart: The “Killer Ape Hypothesis”









C. K. Brain Inside The Cave At Sterkfontein

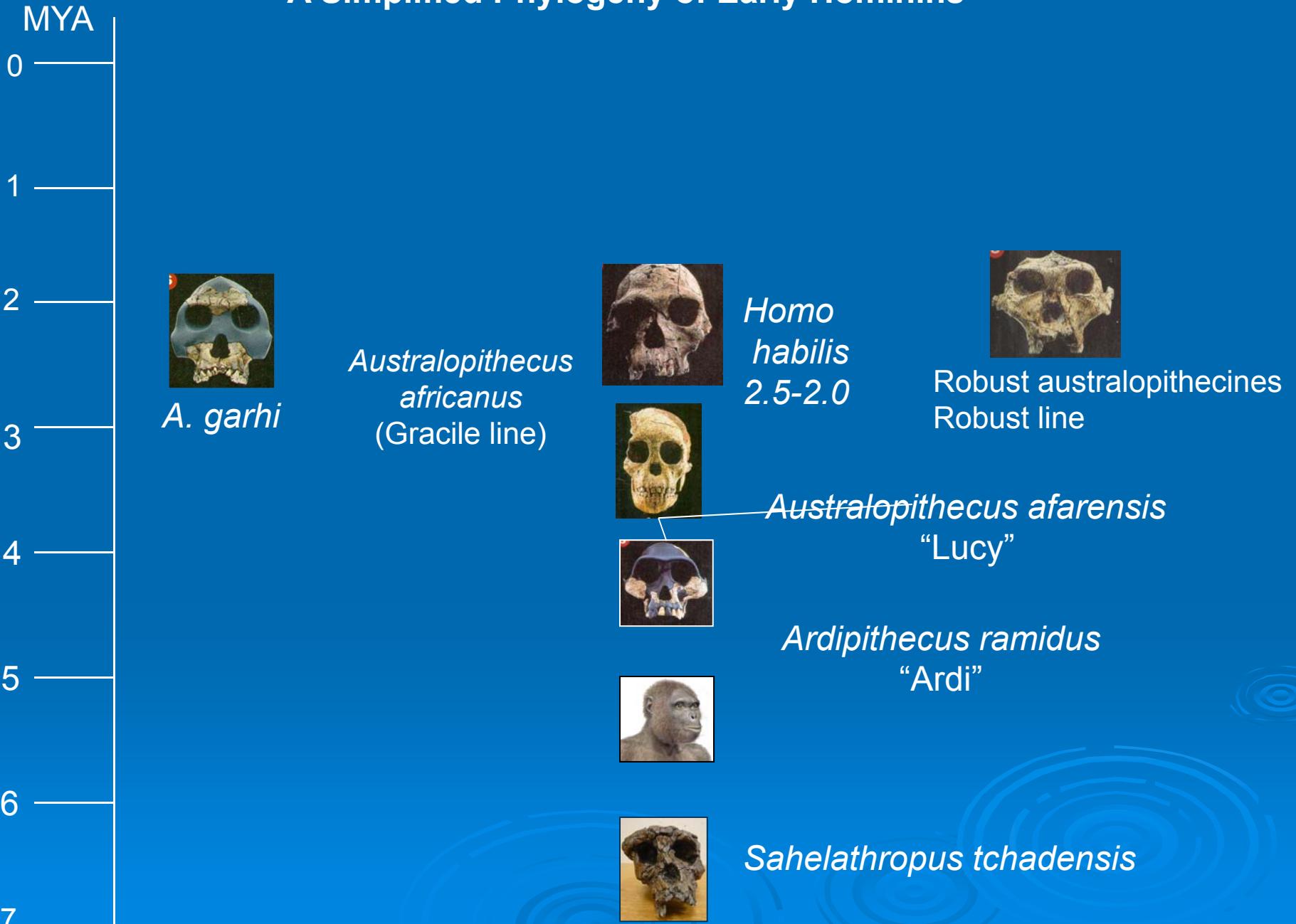




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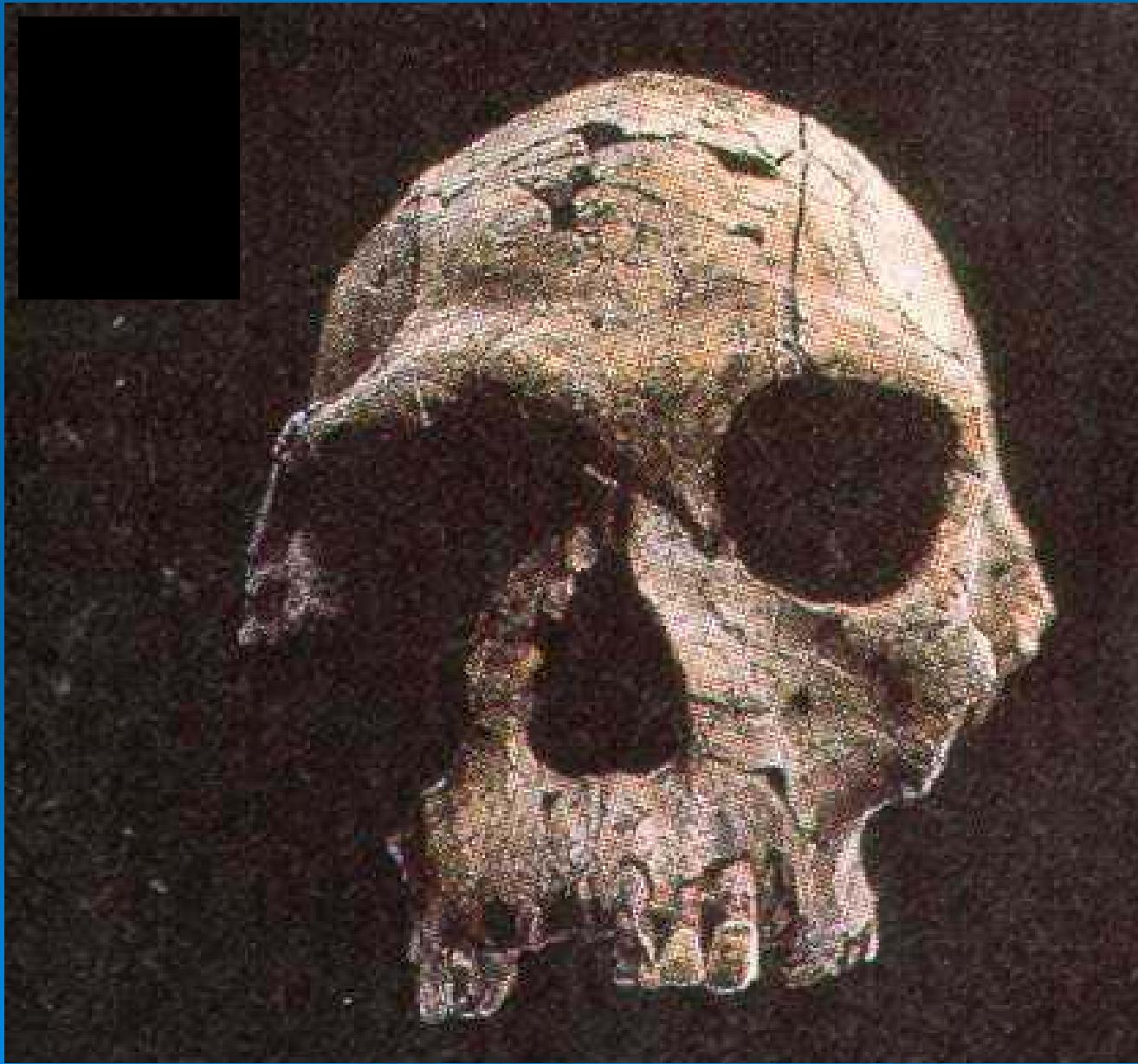
4. The Human Genus: *Homo*

a. Defining traits of *Homo*:

Cranial capacity > 600 cc

Less prognathic

b. Homo habilis 2.5-2.0 MYA



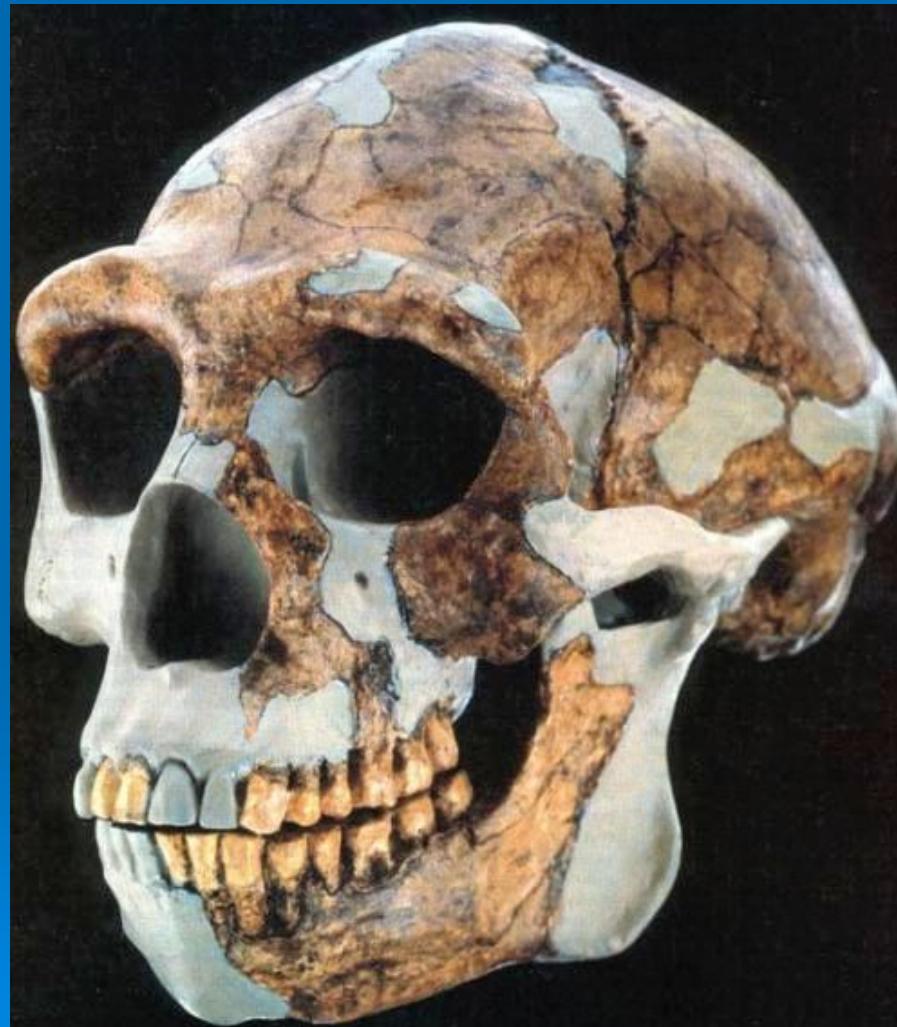
Olduvai Gorge



Louis and Mary Leakey Early 1960s at Olduvai Gorge



VI Out of Africa: Middle *Homo* (*Homo ergaster*, *Homo erectus*, and the Dmanisi skulls)



A Simplified Phylogeny of Early Hominins



A. Classification of the species

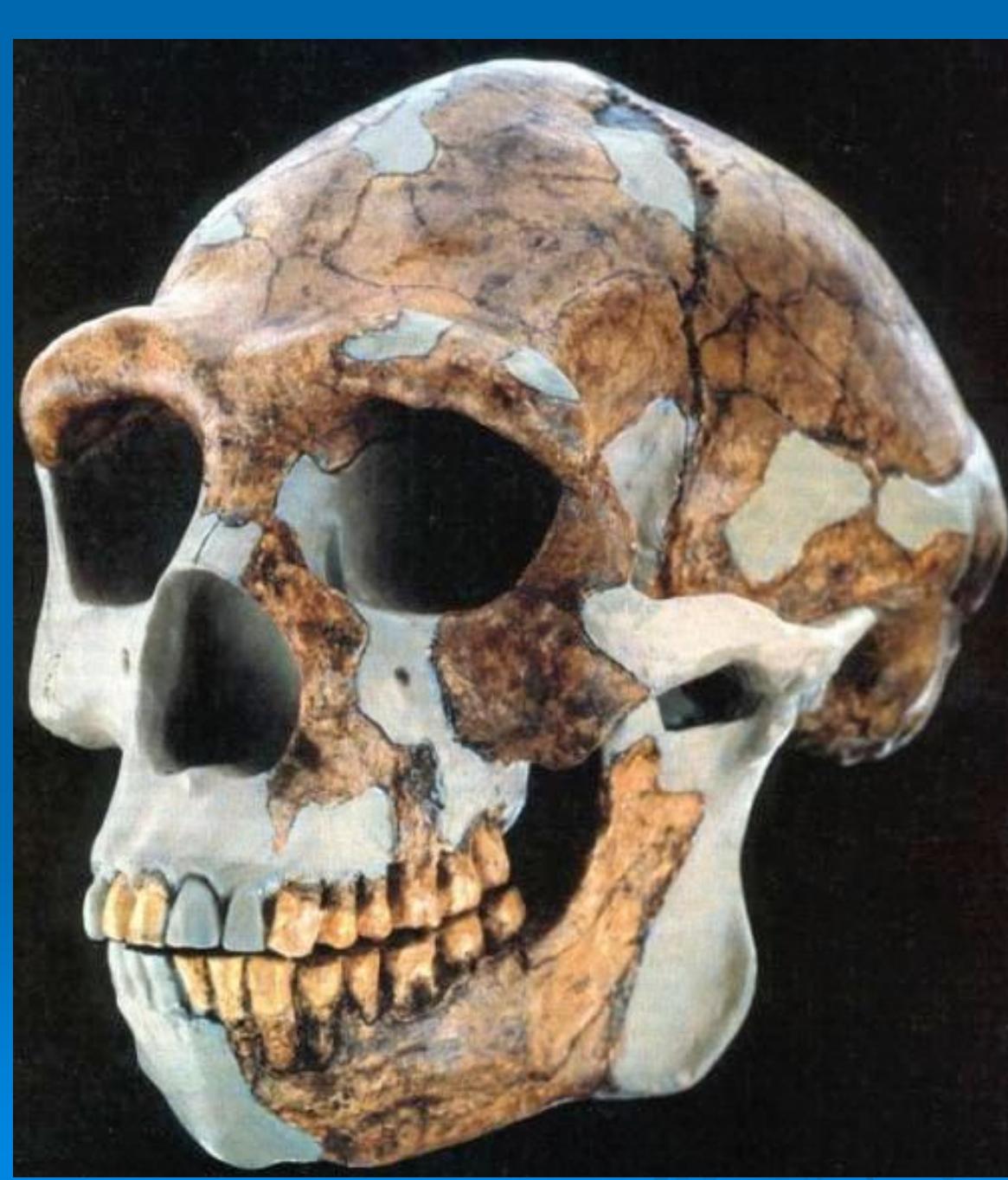
Early Homo= *Homo habilis* 2.5-2.0 MYA

Cranial capacity: 600 cc

Middle Homo= *Homo ergaster* 1.8- 0.2 MYA

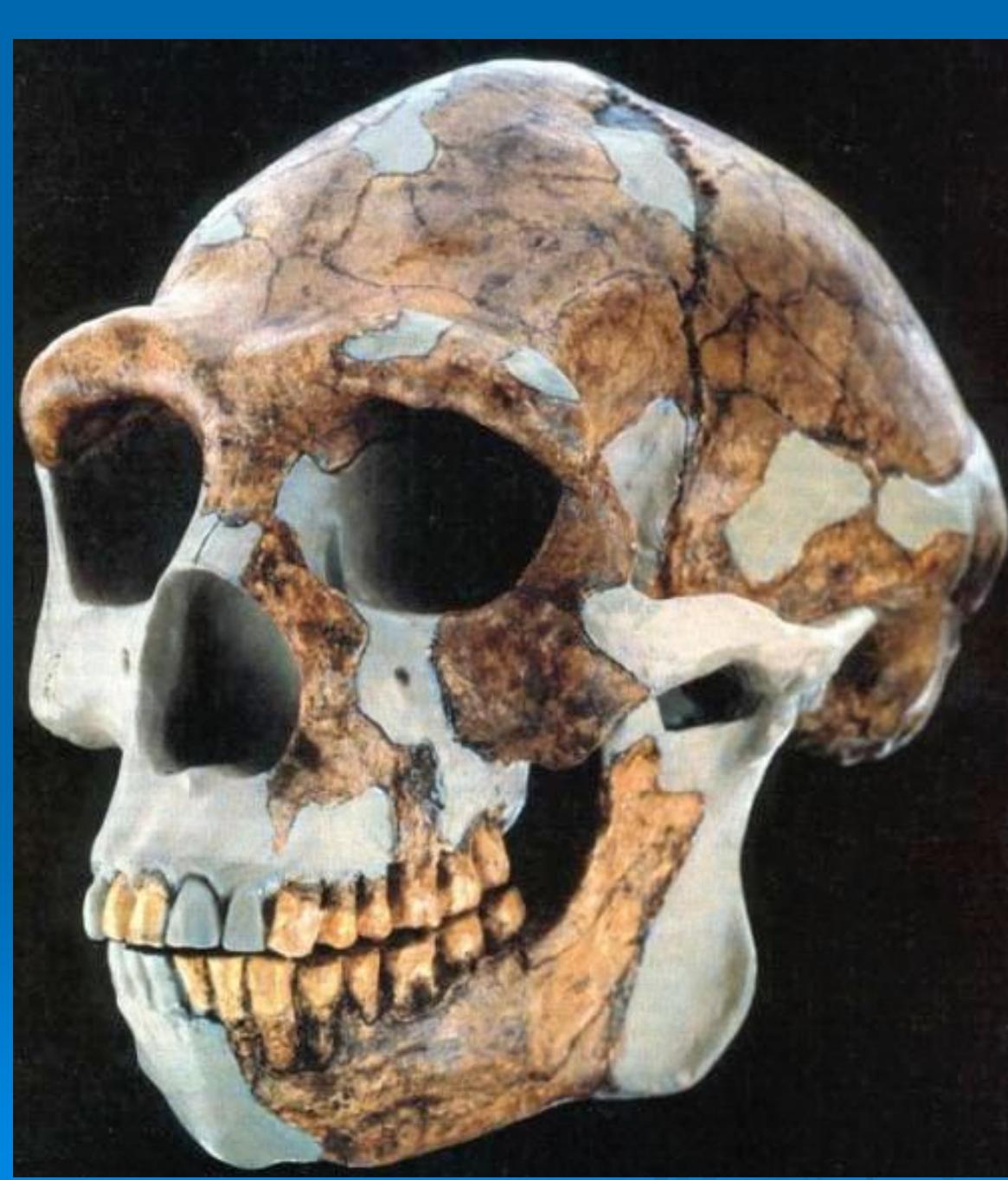
Cranial capacity: 800-1000 cc

Late Homo = *Homo sapiens* \geq 1200 cc



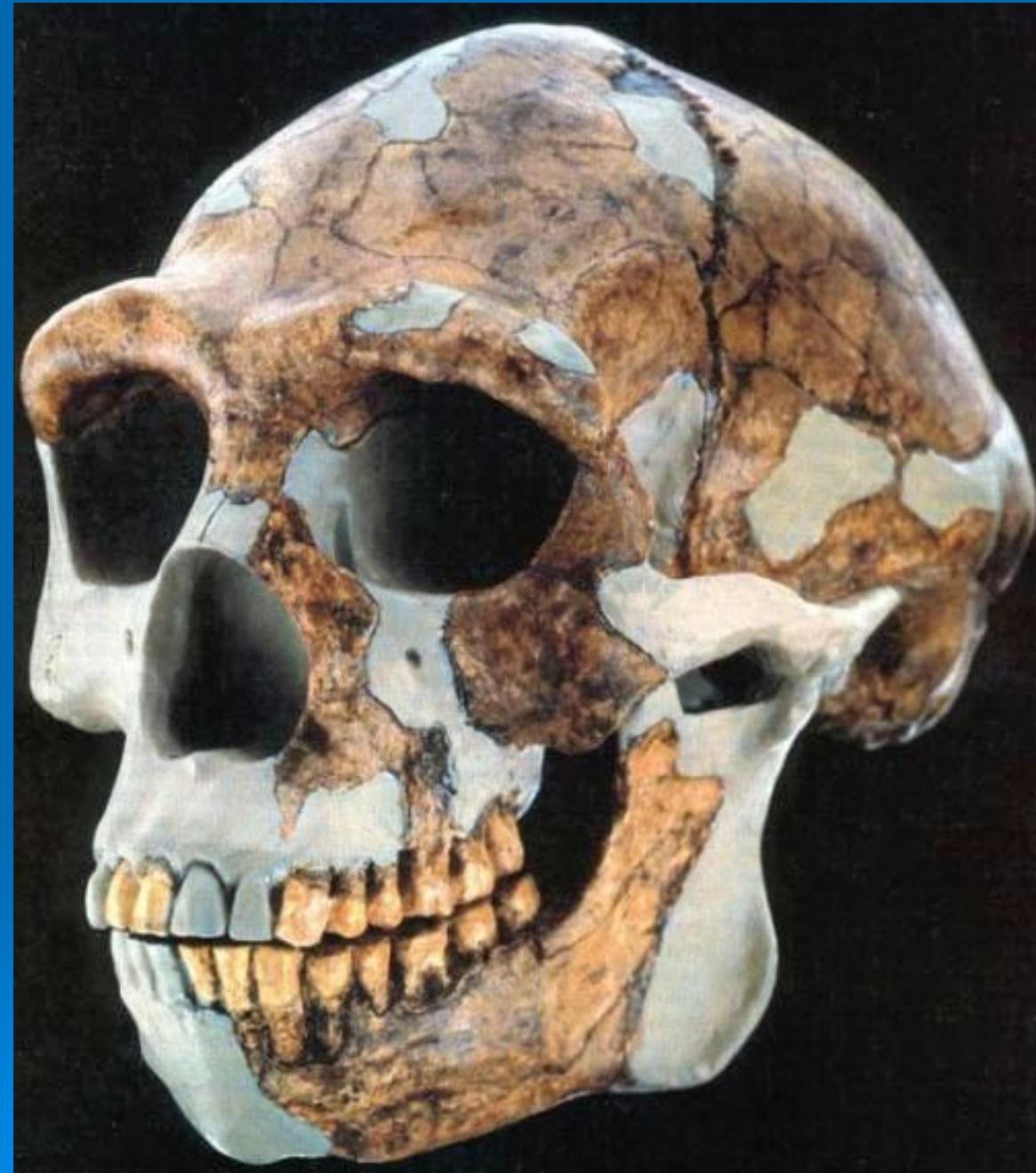
B. Traits of *Homo ergaster*:

- Very robust



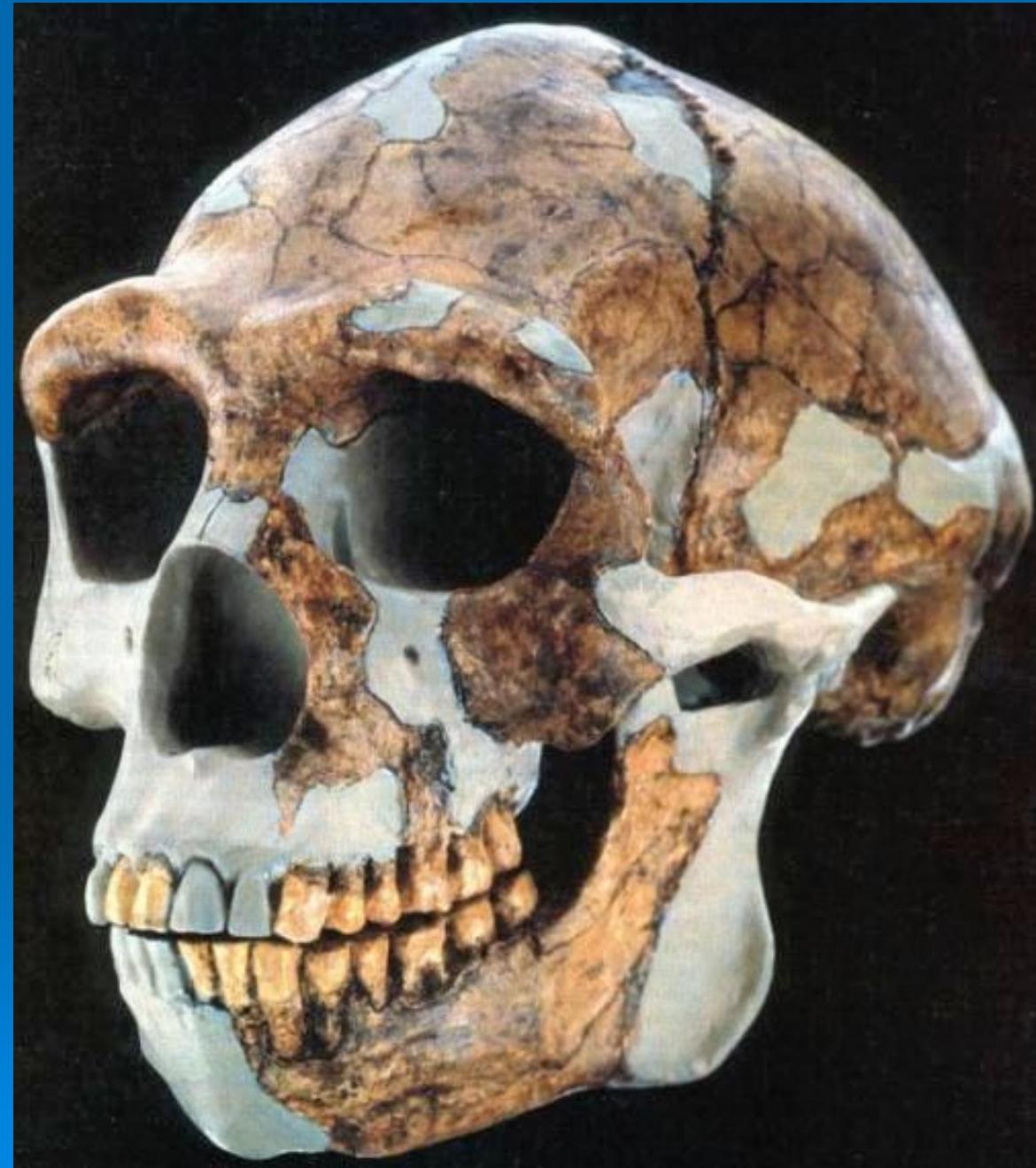
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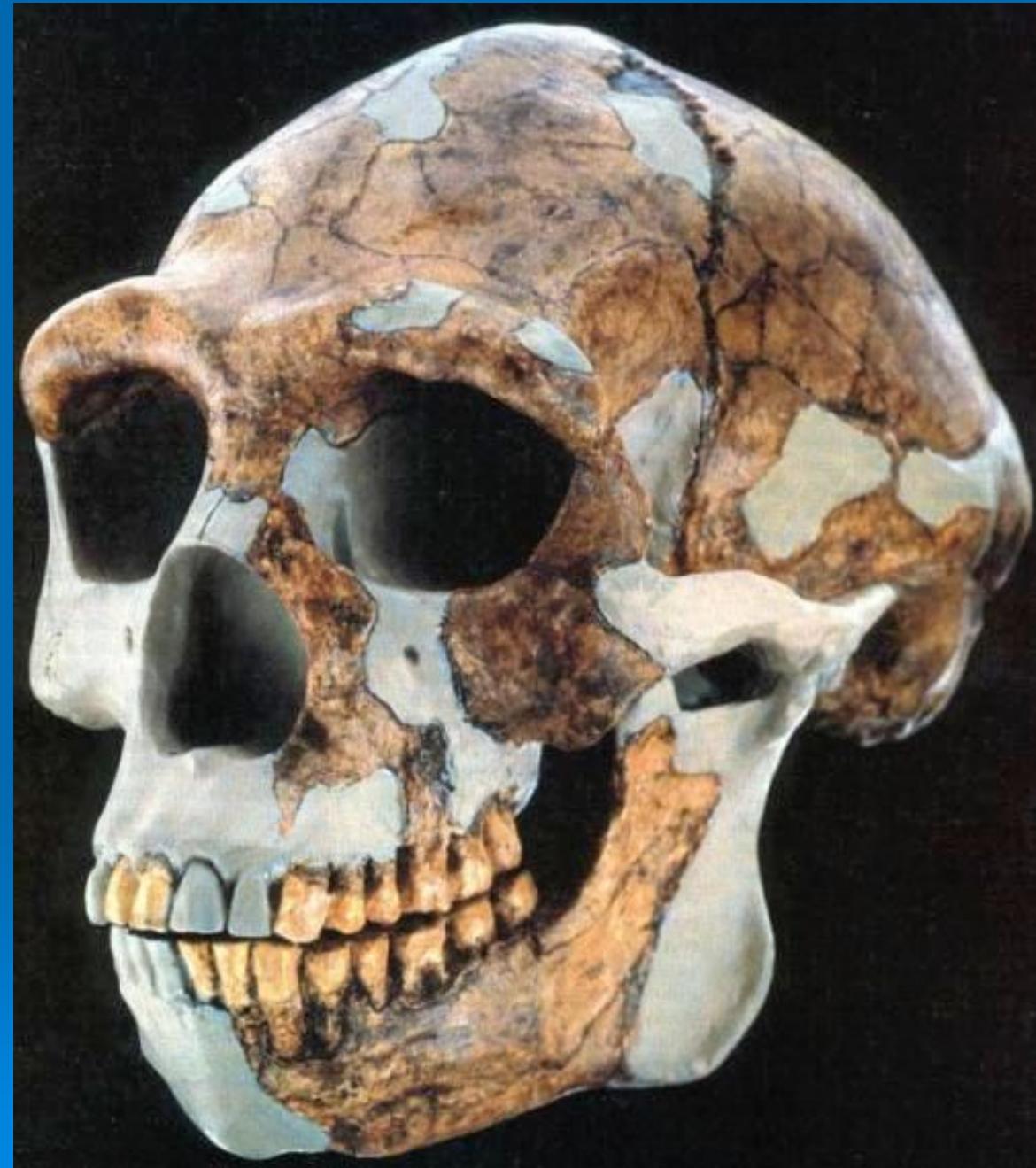
B. Traits of *Homo ergaster*:

- Very robust
- Cranial capacity
- 800-1000 cc
- Massive supraorbital tori
(brow ridges)



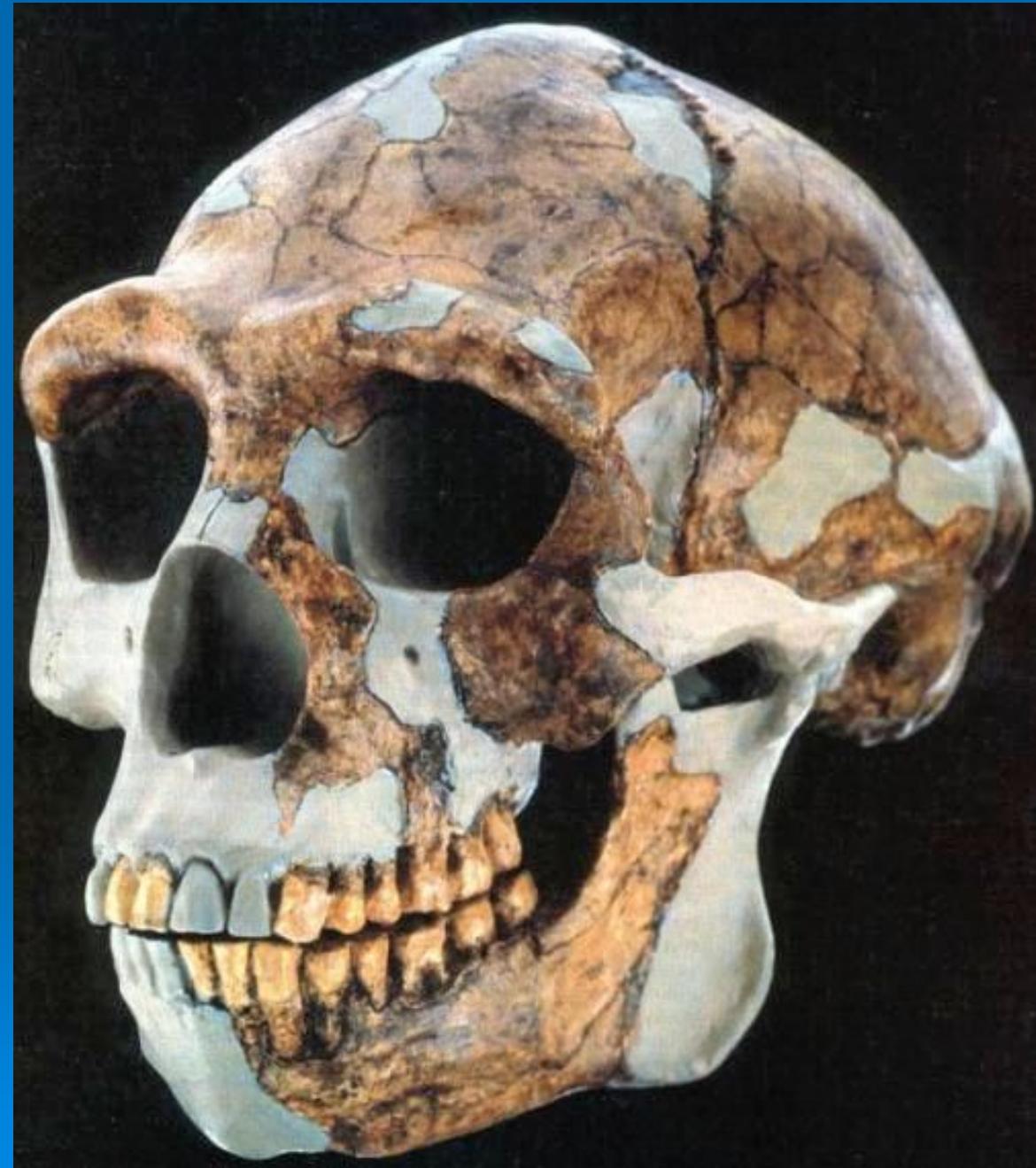
B. Traits of *Homo ergaster*:

- Very robust
- Cranial capacity
- 800-1000 cc
- Massive supraorbital tori (brow ridges)
- Thick cranial wall



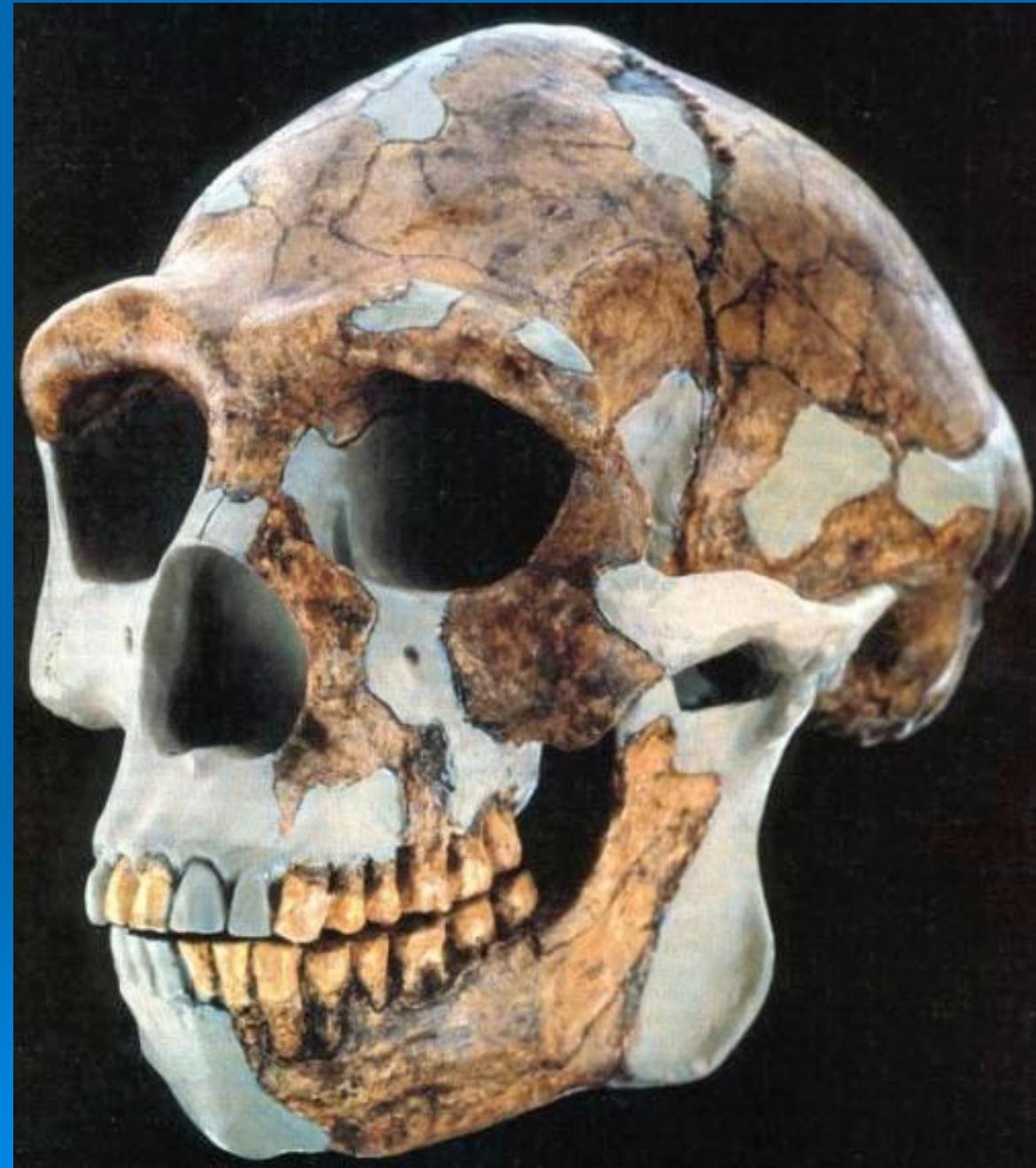
B. Traits of *Homo ergaster*:

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- Almost no forehead



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- Thick cranial wall
- Almost no forehead
- No chin

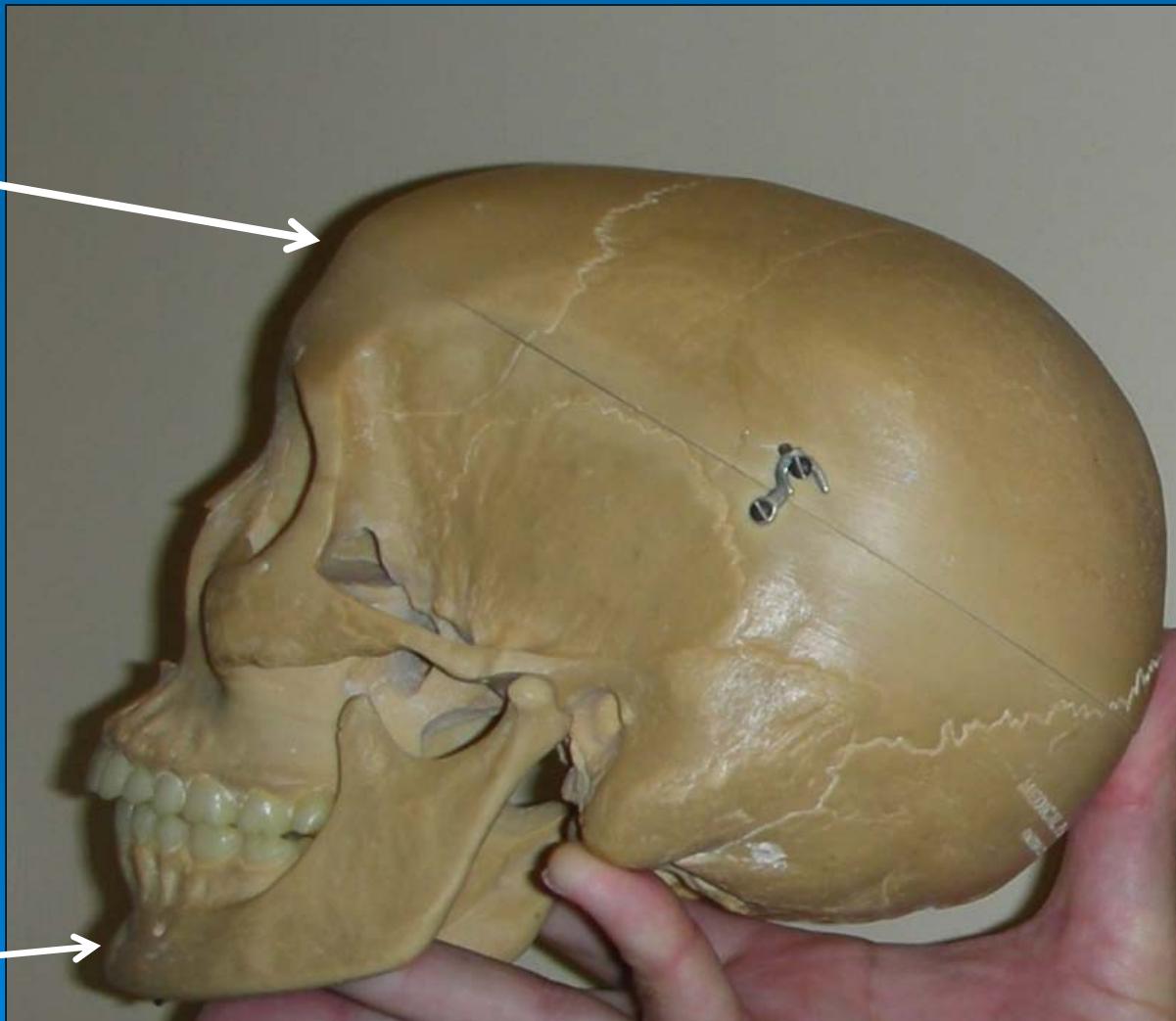


B. Traits of *Homo ergaster*:

- Very robust
- Cranial capacity
- 800-1000 cc
- Massive supraorbital tori
(brow ridges)
- Thick cranial wall
- Almost no forehead
- No chin
- Almost fully modern
post-cranially
(below the neck)
—indistinguishable
from modern humans

Comparison with *Homo sapiens sapiens*

Forehead



Chin

An Introduction To Lithic Technology

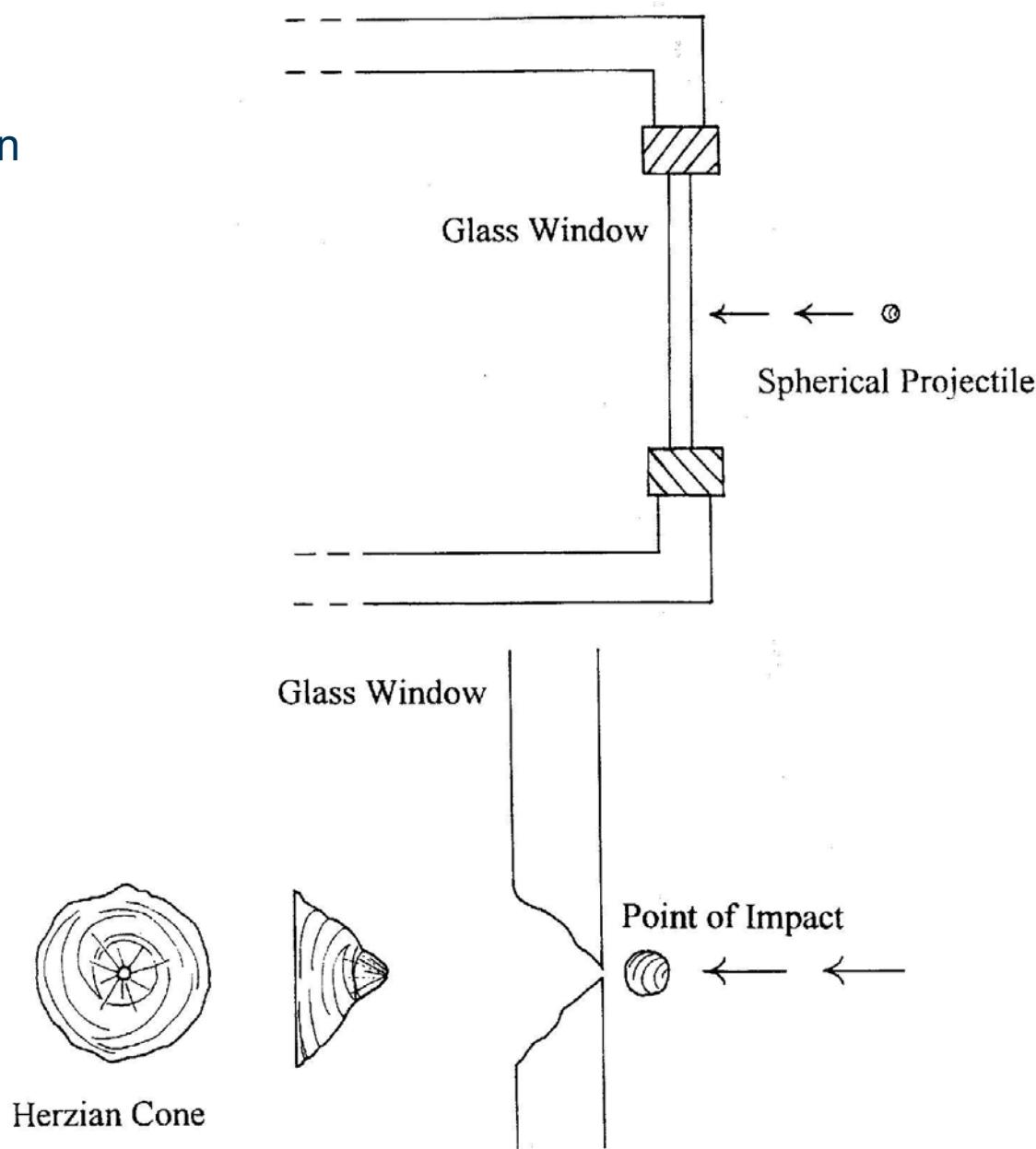


Figure 2.12 Schematic illustration of spherical projectile impacting a pane of glass at a 90° angle to produce a Hertzian cone.