


Dating Techniques

- Relative
- Absolute
- Taphonomy
- Paleoanthropology
- Plate Tectonics
- Etc.

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Primate Evolution

- 65 mya (North America/Europe/N. Africa)
- Grasping extremities
- Arboreal
- Vision (color, depth)
- Insect eating/ omnivorous diet



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Bipedalism



Bonobos: *Pan paniscus*

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Early Hominids and Their Immediate Ancestors

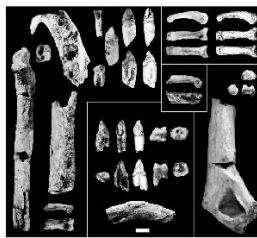
	SPECIES	TIME RANGE (millions of years ago)
pre-hominid apes or ape-hominid transitional species	Sahelanthropus tchadensis	7 - 6.7
	Orrorin tugenensis	6.0
	Ardipithecus ramidus	5.8 - 4.4
early hominids	Australopithecus anamensis	4.2 - 3.9
	Australopithecus afarensis	4.0 - 2.9
	Kenyanthropus platyops	3.5 - 3.2
	Australopithecus bahrelghazali	3.4 - 3.0
	Australopithecus africanus	3.3 - 2.3
	Australopithecus garhi	2.5
	Australopithecus aethiopicus	2.5
	Australopithecus robustus	2.0 - 1.5
	Australopithecus boisei	2.0 - 1.2

The species listed above in red are controversial because of relatively limited discoveries of their fossils and disagreement as to their classification. Those listed in black have been found at many sites and now are widely accepted. Some researchers refer to the robust australopithecines as paranthropoids (genus *Paranthropus*).

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Ardipithecus ramidus

Aramis, Ethiopia
4.4 mya



Ardipithecus ramidus

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Australopithecus anamensis

Kanapoi & Allia
Bay, Kenya
ca 4 mya

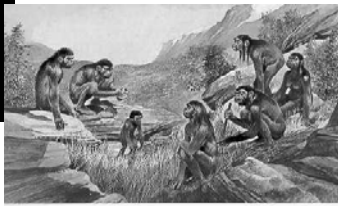
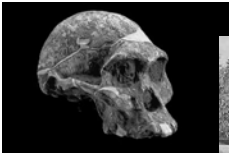


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Australopithecus afarensis

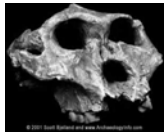


Australopithecus africanus



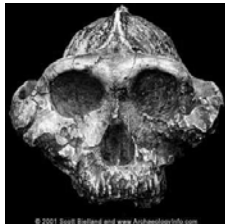
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Australopithecus/Paranthropus boisei/robustus/aethiopicus



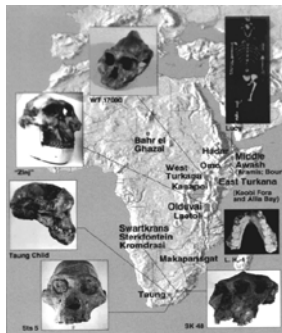
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A. africanus vs. robustus/boisei



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Bipedalism & Climate Change



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Homo habilis

Homo rudolfensis (e.g., ER 1470)
2.4 - 1.9 mya
Homo habilis (1.9-1.6 mya)

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Earliest Tools 2.5 mya

Ethiopia & Kenya

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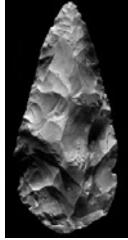
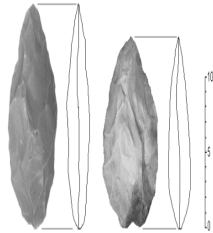
Homo ergaster/Homo erectus

- *Homo ergaster*
 - 1.8-1.5 mya (East Africa)
- *Homo erectus*
 - 1.2-0.2 mya (Africa, Asia & Europe)

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Human Culture

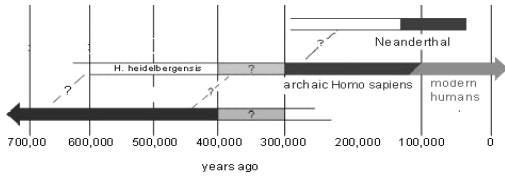
Acheulean Tradition



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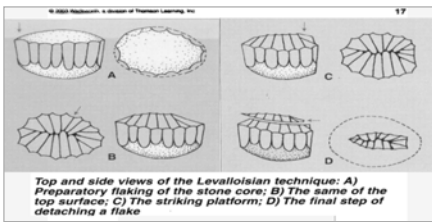
Early Archaic *Homo sapiens*

transitional *Homo erectus*
Homo heidelbergensis/*Homo*
antecessor
archaic *Homo sapiens*



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Levallois Technique



Top and side views of the Levallois technique: A) Preparatory flaking of the stone core; B) The same of the top surface; C) The striking platform; D) The final step of detaching a flake

Neandertals

150,000 - 28,000 (Europe, w. Asia, n. Africa)

Homo sapiens neanderthalensis/Homo neanderthalensis



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Neanderthals: Cro-Magnon

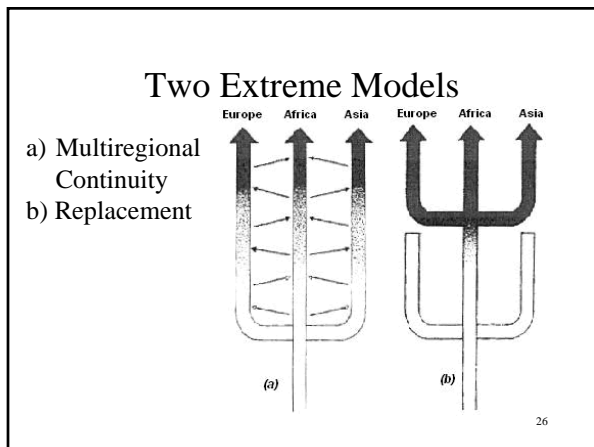


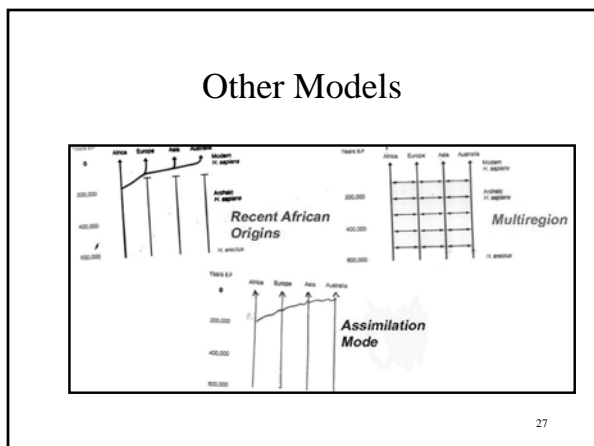
Modern *Homo sapiens*



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Hominid Tree

