Human Evolution
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Are we nearly there yet?
Paranthropus (Australopithecus) robustus
Australopithecines: thousands of fossils and at least 8 species in S., E. and C. Africa
“Phases” of human evolution

- **Human phase 2 – 0 Ma:**
  - Global spread
  - “Human” anatomy
  - Encephalised
  - Dietary range
  - Behavioural complexity

- **Australopithecine phase 4 – 2 Ma:**
  - Widespread in Africa?
  - Bipedal but still partly arboreal?
  - Early tool-use?
  - Predominantly still ape-like?

- **Early phase 7 – 4 Ma:**
  - C - E. Africa.
  - Still poorly known.
  - Earliest bipeds?
  - Largely ape-like?
Olduvai Gorge and the Leakeys
“Zinjanthropus”: human or australopithecine?
East Turkana (N. Kenya): 1.5 – 2.0 Ma
Homo habilis: one or more species?

Homo rudolfensis and Homo habilis?
Australopithecus sediba (Malapa Cave, S. Africa)

THE VIEW FROM MALAPA
Leo Berger’s team suggests that the closest link to Homo links A. sediba directly to H. erectus. If true, more primitive East African Homo fossils would represent a lineage that went extinct.

1 MILLION YEARS AGO (M.Y.A.)
Australopithecus boisei
A. robustus
A. sediba
A. aethiopicus
H. habilis
H. rudolfensis
H. erectus
H. neanderthalensis
H. sapiens

A CROWDED FIELD
Two or possibly three species assigned to Homo coexisted in East Africa around 1.8 million years ago. (Some researchers view a few H. habilis fossils as a separate species, H. rudolfensis.) Larger brained H. erectus eventually gave rise to our own species.

EARLIEST TRACES?
A few fragments older than the Malapa fossils, notably a jawbone from Hadar in Ethiopia, have been described as Homo—calling into question a link between A. sediba and our genus. But Berger’s team has challenged both the age of those fossils and their assignment to Homo.
Becoming human

Meat, guts, and brains

Stone tools
~2.6 Ma
Brain size increase

Lewin
Social brains?
Did increasing African aridity drive Pliocene radiations?
Ecological change

Foraging change
Dietary change
Technology?

Declining 1° productivity
Changing resource distribution

Increased body & brain size

Increased range/dispersal potential

Anton, Leonard and Robertson (2002)
Early humans 1.5-1.8 Ma: Out of Africa 1
**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
“We are naturally led to enquire where was the birthplace of man at that stage of descent when our progenitors diverged from the Catarrhine stock. The fact that they belonged to this stock clearly shews that they inhabited the Old World; but not from Australia nor any oceanic island, as we infer from the laws of geographical distribution. In each great region of the world the living mammals are closely related to the extinct species of the same region. It is therefore probable that Africa was formerly inhabited by extinct apes closely allied to the gorilla and chimpanzee; and as these two species are now man’s nearest allies, it is somewhat more probable that our early progenitors lived on the African continent then elsewhere. “

Descent of Man 1871 p. 199.
Ernst Haeckel (1834-1919)
“Phases” of human evolution

- Human phase 2 – 0 Ma: Global spread, "Human" anatomy, dietary range, behavioural complexity.


The first explorers?

Always a crossroads, the village of Dmanisi (above) once overlooked the old Silk Road through the Caucasus region. Nearly 1.8 million years ago the site lay on a peninsula between the Black and Caspian Seas (map, right), along one of several land corridors into Eurasia. Humans could have moved out of Africa—and back into it—in multiple waves, reaching Java by at least 1.6 million years ago. By one million years ago, Homo had spread across Eurasia, leaving bones and tools in its wake.

Dmanisi, Georgia
~1.8 Ma
Brain size increase

Lewin
Debate about the earliest human dispersals from Africa

An Asian perspective on early human dispersal from Africa
Robin Dennell & Wil Roebroeks 2005
*Nature* 438: 1099-1104

…it is time to develop alternatives to one of palaeoanthropology's most basic paradigms: 'Out of Africa 1'.

Dmanisi

Flores
Contingency (chance events)
The "Hobbit": Homo floresiensis
Origins and evolution?

Lahr & Foley

Reader

Brown

Dmanisi.org
The Asian story...
Getting to Europe...
Evidence of earliest human occurrence in Europe: the site of Pirro Nord (Southern Italy).

Arzarello M, Marcolini F, Pavia G, Pavia M, Petronio C, Petrucci M, Rook L, Sardella R.

1.2 Million year old jawbone found in Sima del Elefante Atapuerca, Spain
*Homo antecessor* 0.8Ma and possibly 1.2Ma?

Atapuerca Spain: Gran Dolina and Sima del Elefante
Some “recent” events in human evolution

Neanderthals and “Hobbit” extinct

First humans in S. Europe?
First humans in Far East?
Out of Africa 1?
Out of Africa 2

Homo sapiens in Africa

Early Neanderthals in Europe

Changes in glacial intensity

First humans in N. Europe/Britain?
How and when did people first get to Britain?

- Fire?
- Clothing?
- Shelters?
- Better hunting?
- Better technology?
The Ancient Human Occupation of Britain

- When did people first arrive?
- Who were they?
- How did they get to Britain?
- What environments did they occupy?
- Was occupation continuous?
- When did our real ancestors arrive?
- When did Britain become an island?

http://www.ahobproject.org
An example of severe climate change in Britain: Three Cliffs Bay, Gower, S. Wales
The marginal position and extreme climates of Britain help us to distinguish and sequence events.
Happisburgh, Norfolk

- Ostend Channel
- Site 4
- Site 5 → offshore
- Site 2
- Site 3 ~840/950ka?

Hill House River sediments

Site 1
Meet the Norfolk relatives

Judges: gay refugees must get asylum

Alan Travis and Afua Hirsch

Supreme court judges yesterday predicted that "more and more" gay and lesbian refugees are likely to seek protection in Britain after a landmark legal ruling recognised the rights of asylum seekers.

Five supreme court justices said gay and lesbian asylum seekers should not be expected to "exercise discretion" in their home countries to avoid persecution. Their ruling met with cheers and applause from campaigners.

But the Home Office moved to dampen claims from anti-immigration groups that the ruling could lead to a mass influx of gay refugees.
conditions similar to those at the ecotonal boundary between deciduous and coniferous woodland, such as occurs in southern Sweden and Norway today.
Figure 1 | Location of Happisburgh and other Early Pleistocene archaeological sites in Eurasia. 

a, Key Early Pleistocene archaeological sites (red dots) in relation to 45° N and the present-day boreal zone.
b, Reconstruction of the palaeogeography of northwest Europe at the time of the human occupation at Happisburgh, showing the Thames draining into the North Sea ~150 km to the north of its present-day estuary.
Homo heidelbergensis Mauer ~600ka?
A common ancestor at 500 ka?

H. heid. in Europe and Africa

LCA of Nea. and sapiens?
The Boxgrove Quarry
Sussex 500,000 years ago
Boxgrove
~500ka

Homo heidelbergensis
Why does *heidelbergensis* brain size reach the modern range?

*H. erectus* (Sangiran)  
*H. heidelbergensis* (Broken Hill)
Technology and brain evolution

Archaeology suggests a late “explosion” in behavioural complexity…

…however, brain size shows a steadier increase
Language?
The Enigma of the Handaxe and spears......

If they were talking to each other, they were saying the same thing, over and over and over... Desmond Clark
The enigma of Schöningen
Our future is partly up to us....