Neanderthal fate?
- “gone” by 32-28 ka
- anatomically modern humans (AMH)
- multiregional model
  - gene flow
  - replacement model
  - no gene flow
- mtDNA
  - African origin
  - genetic clock
- model predictions...
  - dates; transitional frms

Anatomically Modern Humans (AMH)
- “vaulted” cranium
- 1350-1450 ml
- no brow ridges
- flat face
- chin
- high variability!

Skhul V, Israel
90 ka

Anatomically Modern Humans (AMH)
- coexistence; abrupt behavioral shift
- early AMH fossils
  - Africa, West Asia, East Asia, Europe
- transitional or hybrids?
- coexistence in W. Asia
- shifts in behavior
- weak replacement model

Multiregional Evolution
region A region B region C

- gene flow
- no gene flow
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Gene Flow
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replaced by AMH

Replacement Model

region A region B region C

Dispersal and Replacement

H. sapiens neanderthalensis
- subspecies of us
- full genetic/cultural compatibility

H. neanderthalensis
- different species from us
- no genetic/cultural compatibility

mtDNA and “African Eve”

- properties/predictions
  - inherited maternally
  - fast mutation rate
    - place of greatest diversity = place of oldest population
    - can use as a “clock” = 1 mutation / 6-12 ka

- conclusions
  - all mtDNA lineages can be found in Africa
  - 16 mutations * 12 ka
"Out-of-Africa" Model

Replacement (Out-of-Africa) Model Predictions

1. AMH fossils oldest in Africa
2. transitional forms only in Africa
3. coexistence of archaic & modern humans outside Africa
4. behavior of early AMH outside Africa linked to an African source

Earliest AMH
- Omo 1, 127-37 ka
- Klasies, 120-70 ka
- Qafzeh/Skhu, 100 ka
- Liujiang, 100 ka (?!?)
- Cro-Magnon, 30 ka

Jebel Irhoud, Morocco

Replacement (Out-of-Africa) Model Predictions

1. AMH fossils oldest in Africa
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African transitional forms

- Florisbad, >200 ka?
- Herto, 160 ka
- Ngaloba (LH 18)

neanderthal-modern hybrids?

Lagar Velho, Portugal, 25 ka
(also Mladec, Kulna, Sipka, Vindija)

Replacement (Out-of-Africa) Model Predictions

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Qafzeh-Skhul v. Amud-Kebara-Tabun

Skhul V, early AMH
120-80 ka

Kebara, Neanderthal
60 ka
Tabun Neanderthal and Skhul/Qafzeh contemporaneous at 100ka

modern human behavior earliest in Africa

- Bone points, Katanda, Zaire
- Blades, Lake Baringo, Kenya
- Ochre use, Blombos, South Africa

behavior vs. hominid types
- modern anatomy – archaic behavior!
- Qafzeh and Skhul 120-80 ka

behavior vs. hominid types
- archaic anatomy – modern behavior!
- Chatelperronian, SW France and N Spain, (45?) 36-32 ka

Skhul V

associated MP stone technologies

St. Césaire neanderthal

mix of MP-UP tools in Chatelperronian
Neanderthal ornaments from Arcy-sur-Cure?

Weak Replacement Model
- AMH did arise in sub-Saharan Africa ~200 ka
- dispersal “out of Africa” brought AMH into contact with archaic H. sapiens populations in other regions
- there was “some” gene flow and probably some cultural exchange
  - Relative contributions: 70/30, 80/20, 90/10?
- archaic H. sapiens populations were simply “swamped” genetically and culturally

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- why replacement?

A modern adaptive advantage?