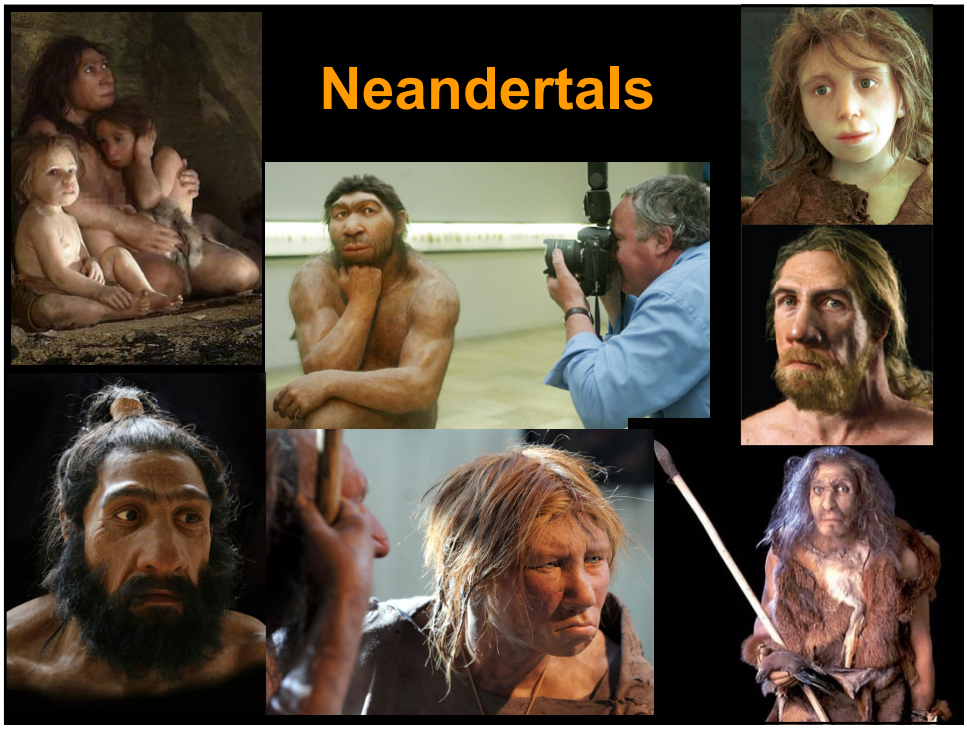
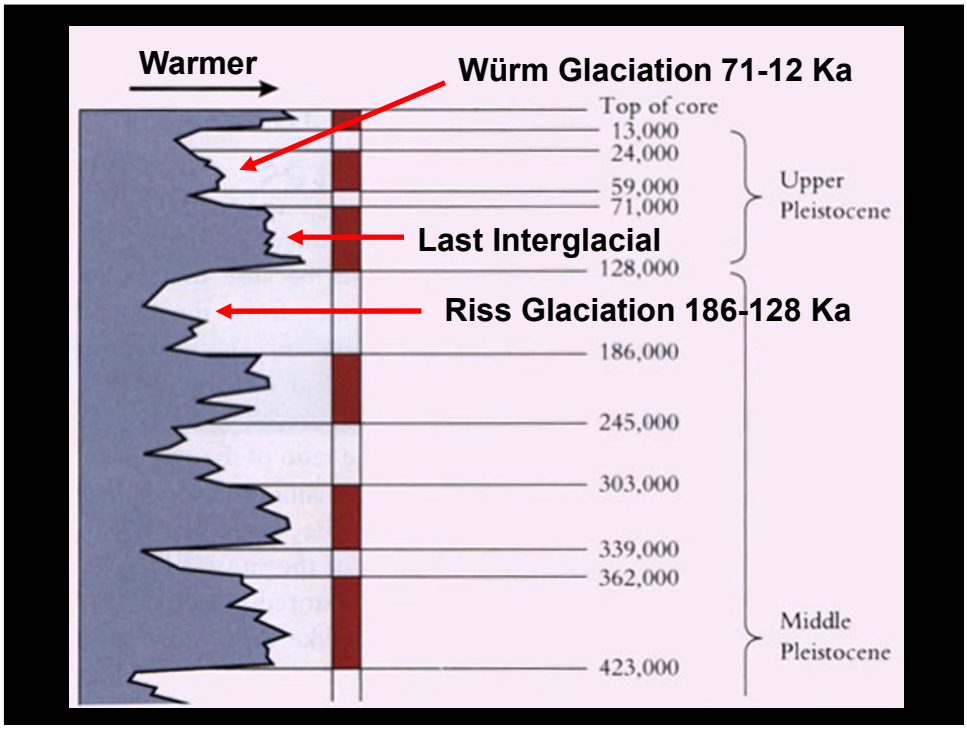


1

Pronunciation & spelling lesson

- When first discovered, they were called *Homo neanderthalensis* (now *Homo sapiens neanderthalensis*)
- Based on German: Neander Valley (Thal)
- In German, “th” is always pronounced “t”
- Neanderthal (if not speaking of taxonomy but just a group of fossils)
- Neandertal (after spelling change)

2



3

Geographic distribution
(~130 to 40 Ka)

4

Earliest discoveries

- Engis, Belgium, 1829
- Forbes' Quarry, Gibraltar, 1848
- "Official" discovery: Neander Valley (Neander Thal), Germany, 1856

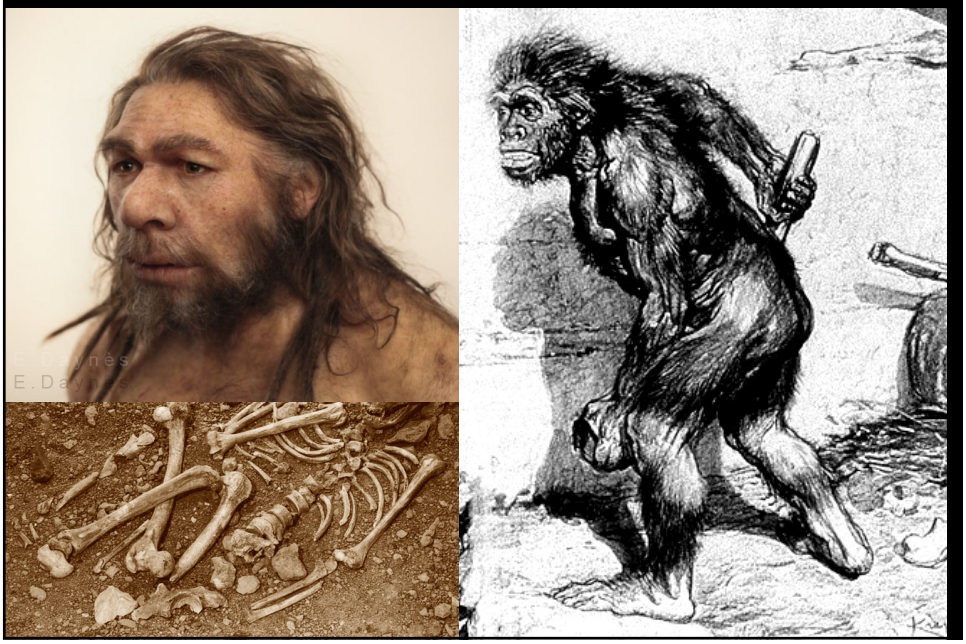
- *The Origin of Species*: 1859!

5

Neander Valley, Germany (1856)

6

Boule: Neandertal stereotype



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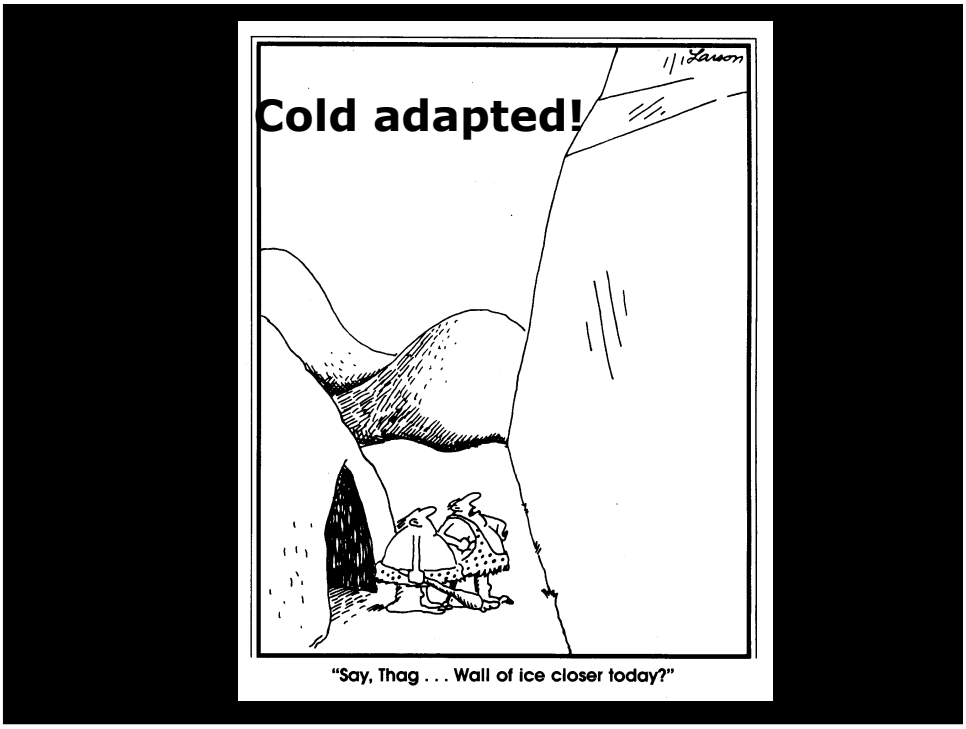


8

Specialized *H. heidelbergensis*

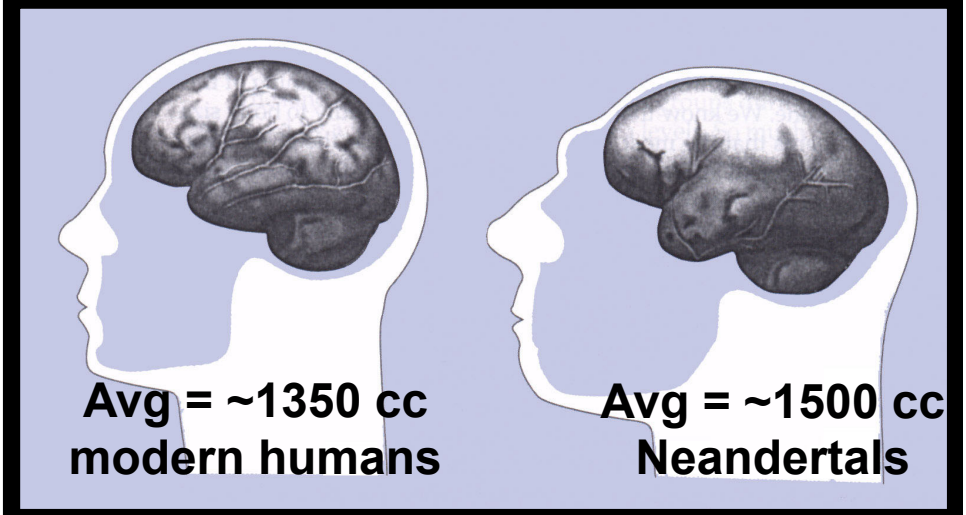
La Ferrassie, Neandertal

Petralona, *Homo heidelbergensis*

- *H. heidelbergensis* adapts to glacial conditions in Europe
- These cold adapted *Homo* are the Neandertals

9

Neandertals had LARGE BRAINS



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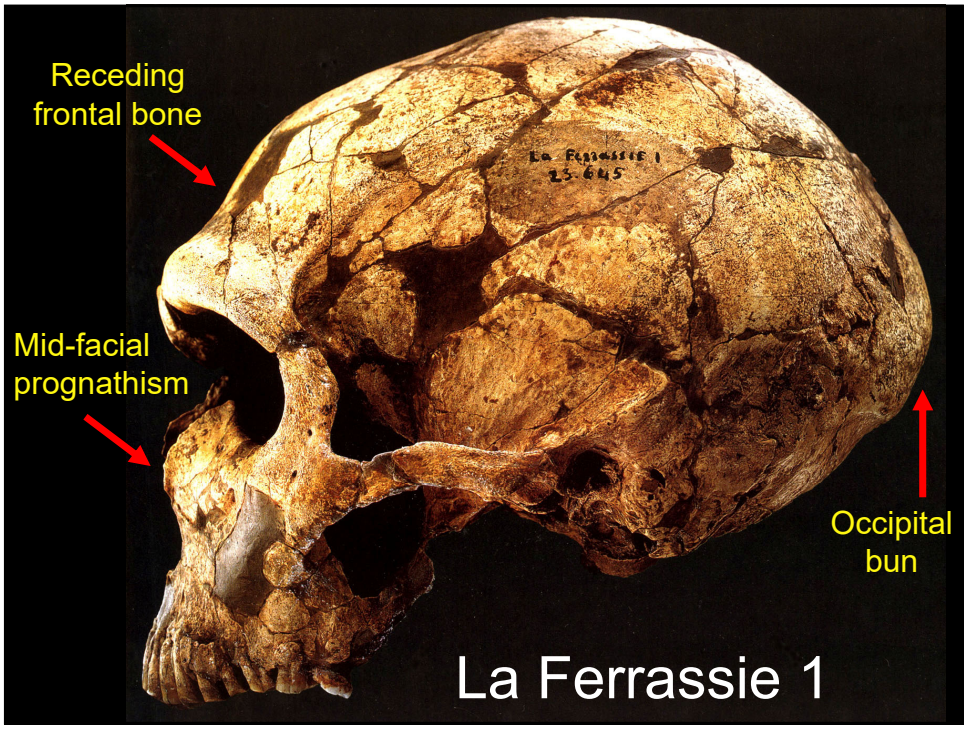
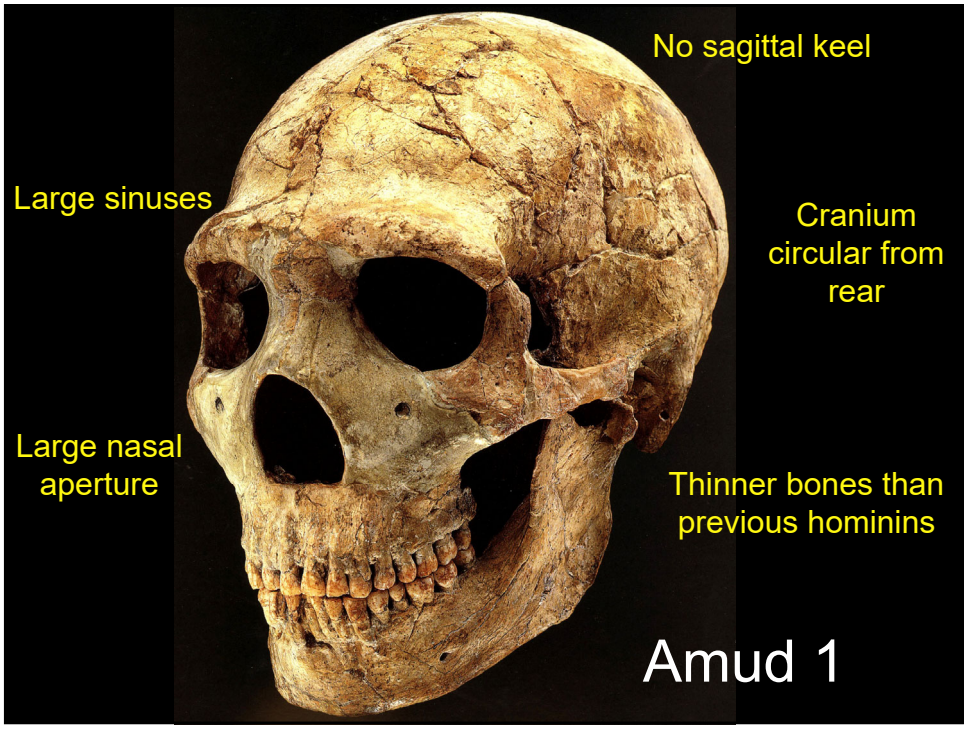
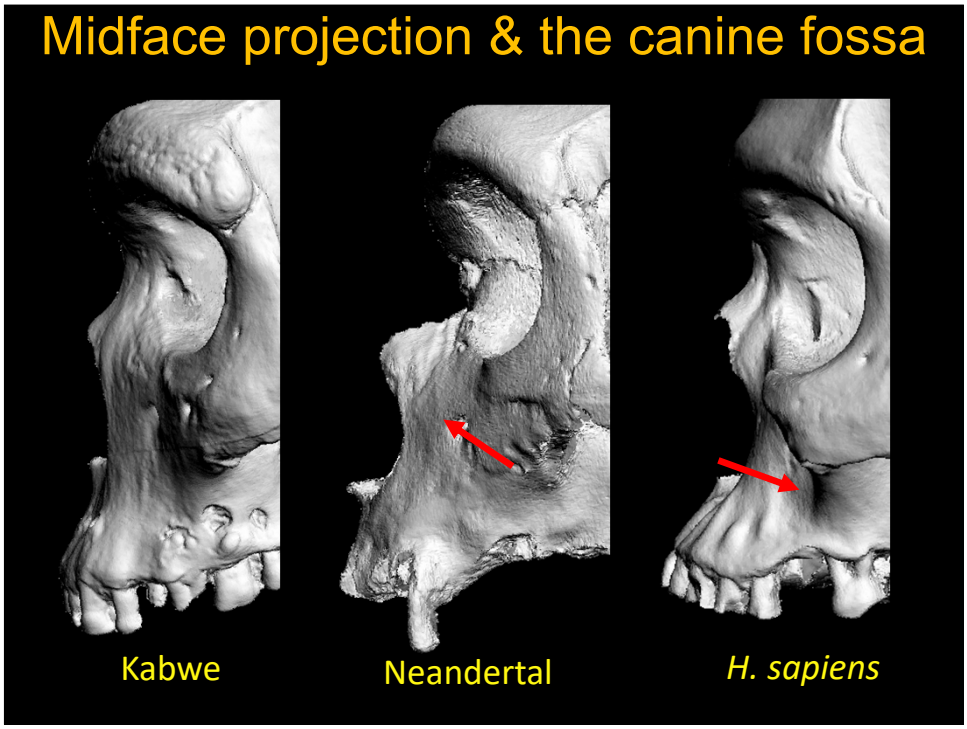

Receding frontal bone
Mid-facial prognathism
Occipital bun
La Ferrassie 1

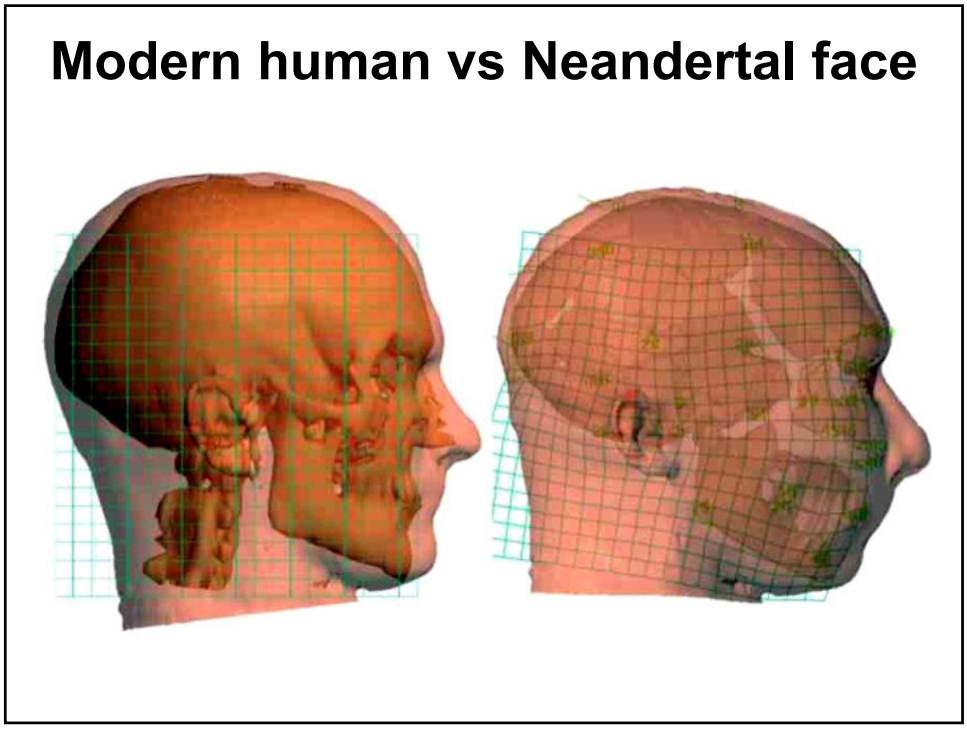
11


No sagittal keel
Large sinuses
Cranium circular from rear
Large nasal aperture
Thinner bones than previous hominins
Amud 1

12


Midface projection & the canine fossa
Kabwe
Neandertal
H. sapiens

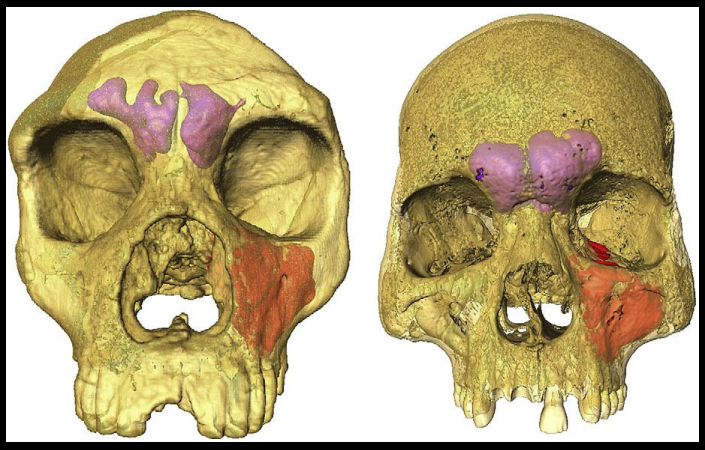
13


Modern human vs Neandertal face

14

Nasal cavity and sinuses

Probably not related to cold adaptations; Neandertals have big sinuses because they have big heads

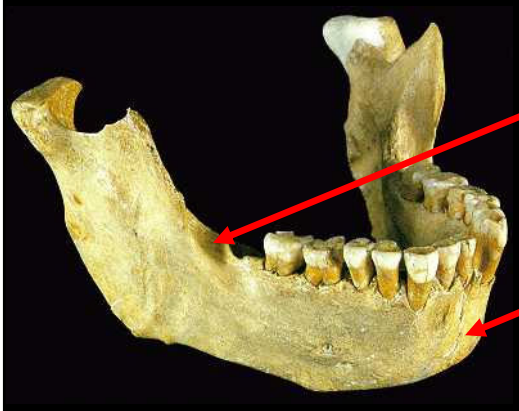


Gibraltar 1, Forbes' Quarry

Modern human

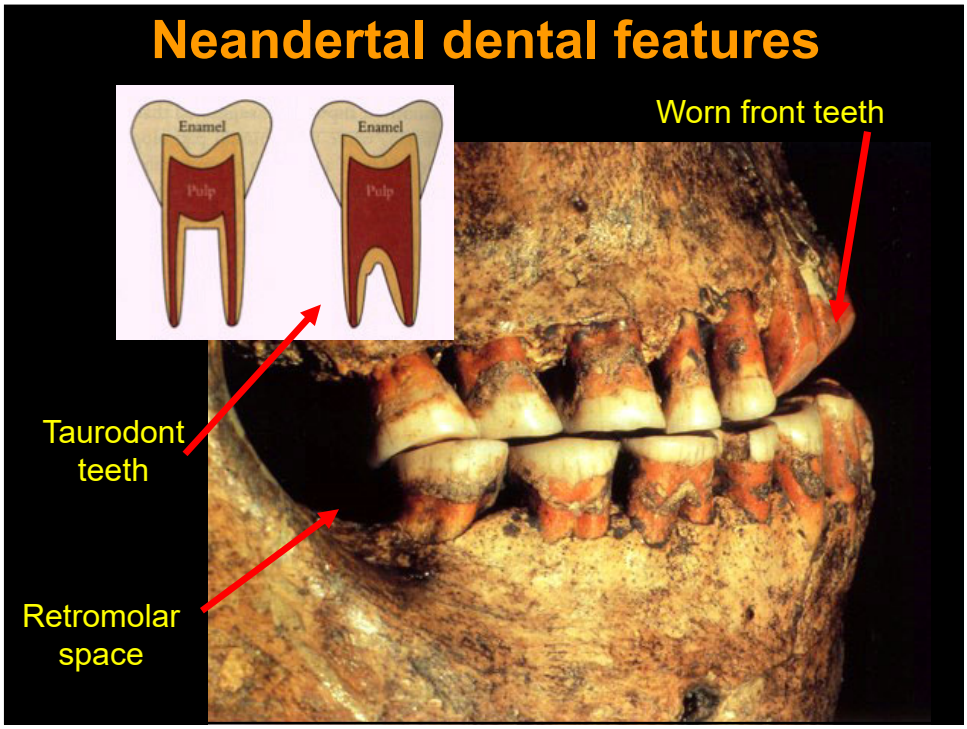
15

Neandertal mandible



- Retromolar space (behind 3rd molar)
- No chin (like all hominins except *H. sapiens sapiens*)

16


Neandertal dental features
Enamel
Pulp
Enamel
Pulp
Worn front teeth
Taurodont teeth
Retromolar space

17

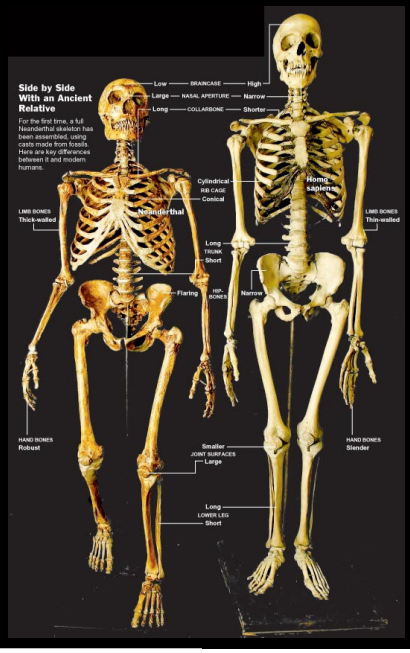
18

Anterior (incisor) tooth wear

"Paramasticatory" activity?

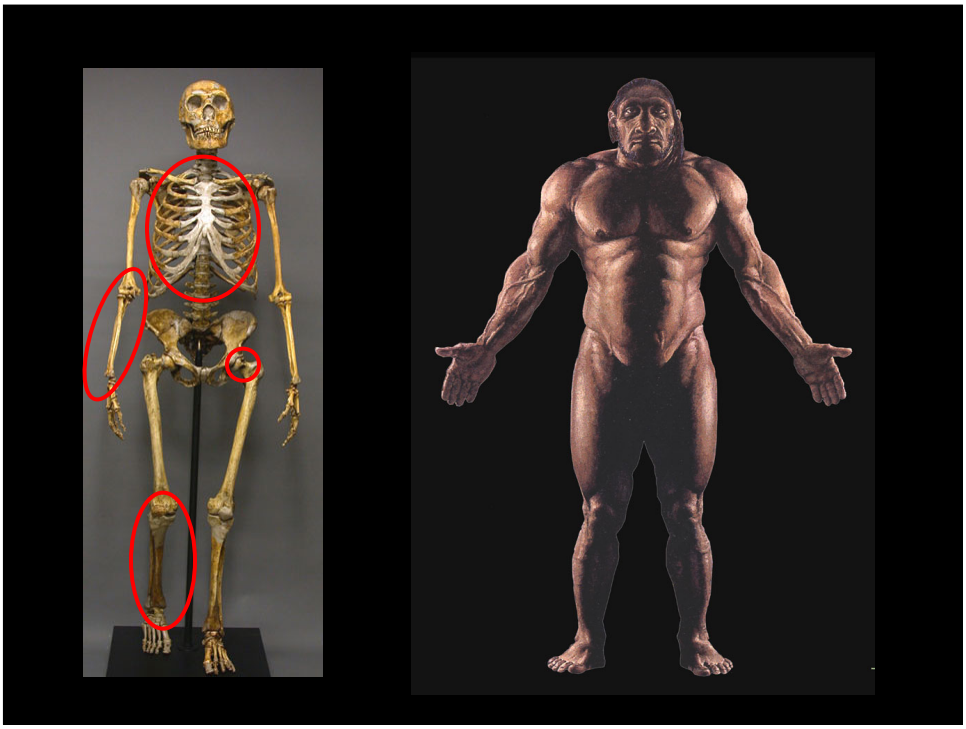
19

Neandertal skeleton



- super robust
- heavily muscled
- thicker limbs
- barrel-shaped chest
- bowed femora
- weighed 30% > AMHs
- limb proportions like modern Arctic people

20



21

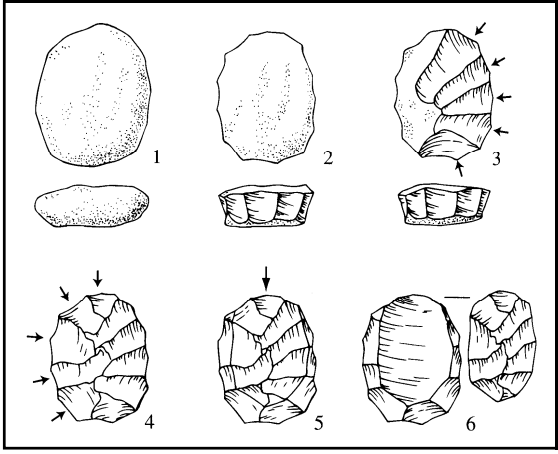
Neandertal behavioral ecology

- Stone tools
- Subsistence (hunting)
- Art & symbolism
- Settlements
- Burial
- Pathologies
- Language

22

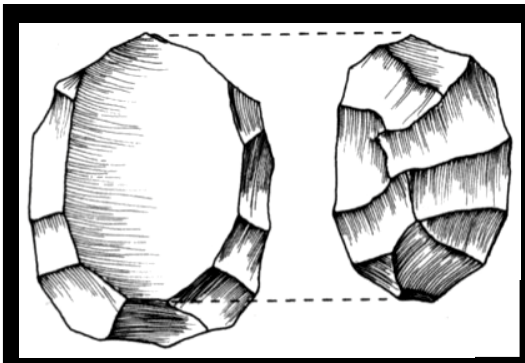
Mousterian

- Stone tool industry from 250-40 Ka
- Neandertal sites
  - almost NO hand axes (unlike *H. erectus*)
  - NO bone tools (unlike Upper Paleolithic)



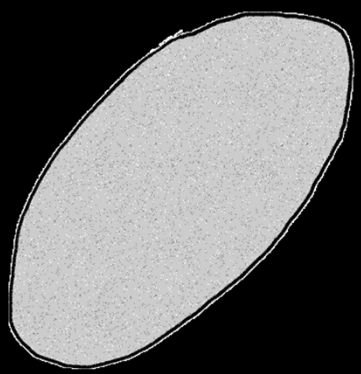
Levallois technique

23



Levallois technique

- Shaping the core to produce a flake or a point of a predetermined shape



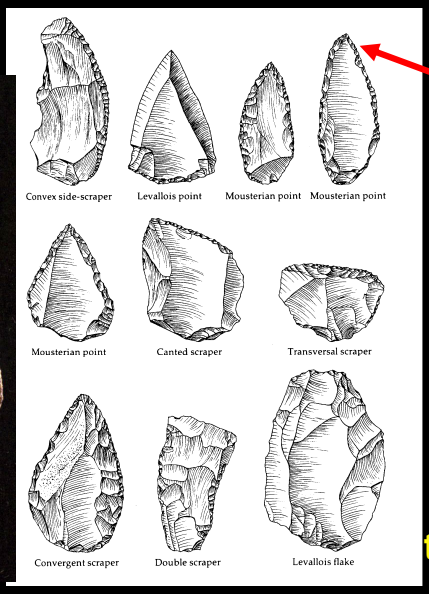
24

25

Mousterian tools

26

Mousterian tools



Reshaped edges

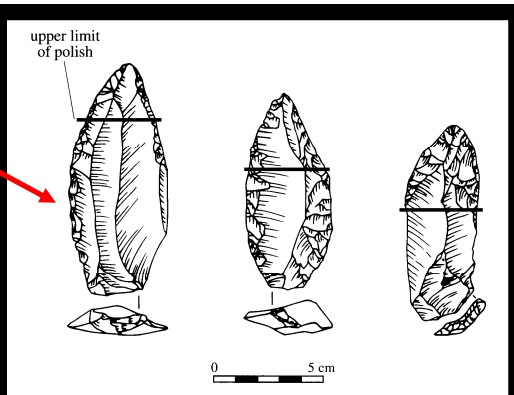
Stronger & sharper

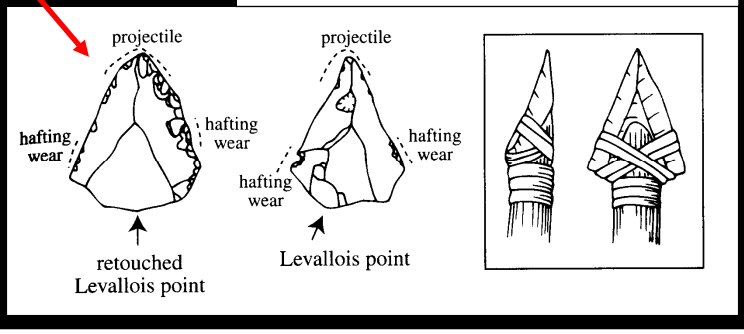
Diverse tool types

27

Evidence of having been held with wooden handles

Evidence of having been hafted onto wooden handle





28

Châtelperronian industry

Overlaps in time with Neandertals & AMH in Europe – could both be making these blades? (maybe)

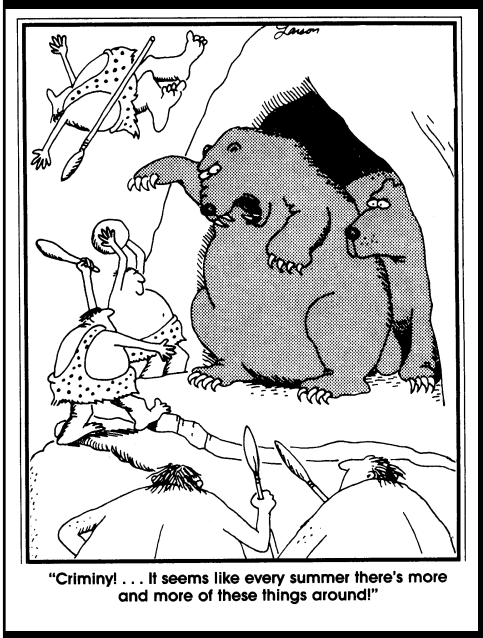
35-29 Ka

29

Subsistence

- Successful big-game hunters- horses, mammoths, deer, bison etc.
- Attacked from close-range with spears
  - "rodeo rider" type injuries
  - head & neck injuries
  - healed fractures
- Also gathered plant material where and when available

30



Hunters or scavengers?

- Prime age animals common - not just old or sick
- Jumbles of bones at bottoms of cliffs, suggests drives over cliffs as hunting strategy
- Bones from the meatiest parts of animals are overrepresented - unlikely if scavenged prey

31

Neandertal cave art?

Three caves across Spain, at least 64.8 Ka (dated carbonate deposits overlaying the images)

Recently critiqued regarding dating errors, cherry-picking oldest dates, non-contemporaneity.

32

Neandertal ornamentation

Perforated shells and mineral pigments, Cueva de los Aviones, Spain, 120-115 Ka

Necklace made from perforated teeth and ivory, Arcy sur Cure, France, ~40 Ka

Eagle talons suspended on a necklace or bracelet, Krapina, Croatia ~130 Ka

33

Settlements

Occupied caves, rockshelters

Possible open air shelters - but do not preserve as well

Caves contain hearths

- indicates control of fire

- living sites NOT butchering sites

34

Kebara, Israel
(60 Ka)

Burial

- Evidence for deliberate burials from La Chapelle-aux-Saints & La Ferrassie, France & Shanidar, Iraq
- Little evidence of any symbolic or ceremonial treatment - no association with artifacts (maybe Regordou and La Ferrassie)
- Suggested for Shanidar 4 - fossil pollen found in grave suggesting flowers around the body. [Most likely resulted from animal burrowing.]

35

Trauma & pathology

- Died rel. young, by about 40 to 45 years of age
- Hard lives: healed fractures, periodontal disease, osteoarthritis, etc. Probably needed HELP from others to survive.
- Shanidar individual (60-45 ka):
  - Crushed outer left eye orbit - brain damage?
  - Withered right arm due to partial paralysis on the right side?

Shanidar 1, Iraq

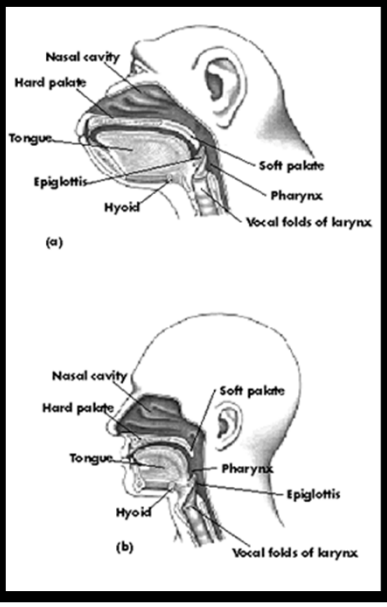
36

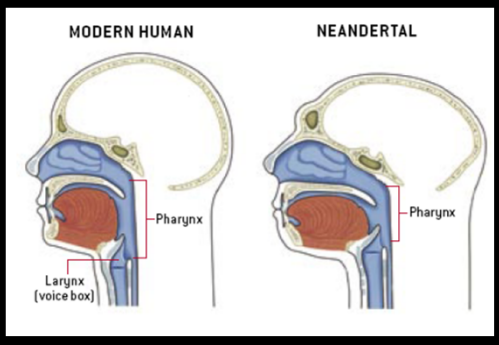
Language?

- Hyoid bone (anchors tongue muscles) from Kebara - identical to modern human hyoid
- Genetic evidence – non-mutated version of the FOX2P gene

37

Position of larynx/length of pharynx



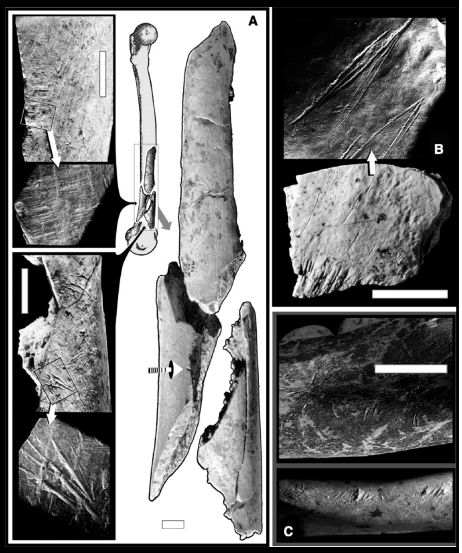


Capacity vs. execution

38

Cannibalism?

Krapina, Croatia
130 Ka



Moula-Guercy, France, 100 kya

39

Ancient DNA (aDNA)

- Over 70 Neandertals tested
- Modern human and Neandertal DNA 99.5-99.9% identical
- Neandertal mtDNA
  - distinct from and not found in *H. sapiens*
  - reflects small effective population sizes
  - early Neandertals have greater diversity than latter, Central Asian Neandertals more than European ones – western Asian origin?

40

Neandertal Genome Project

- Full genome: nuclear DNA, not just mtDNA
- Modern humans of non-Subsaharan African ancestry have ~1-3% Neandertal DNA (maybe even as high as 6%)
- Certain regions devoid of Neandertal genes, particularly X chromosome and genes related to testes
- Some Neandertal DNA found in genes related to Type 2 diabetes, lupus, Crohn's disease, but also resistance to certain viral infections

41

Neandertal Genome Project

- Variable skin color – some had a low-functioning MRC1 gene (pale skin and red hair), though different mutation than in modern humans
- Neandertal alleles for keratin (skin and hair) particularly common in modern humans (POU2F3 in 66% of East Asian people, BNC2 in 70% of Europeans)
- Ability to taste bitter substances– same alleles as modern humans

42