Laurea Magistrale in QUATERNARIO, PREISTORIA E ARCHEOLOGIA

Master in QUATERNARIO e PREISTORIA

Il Popolamento dell'Europa

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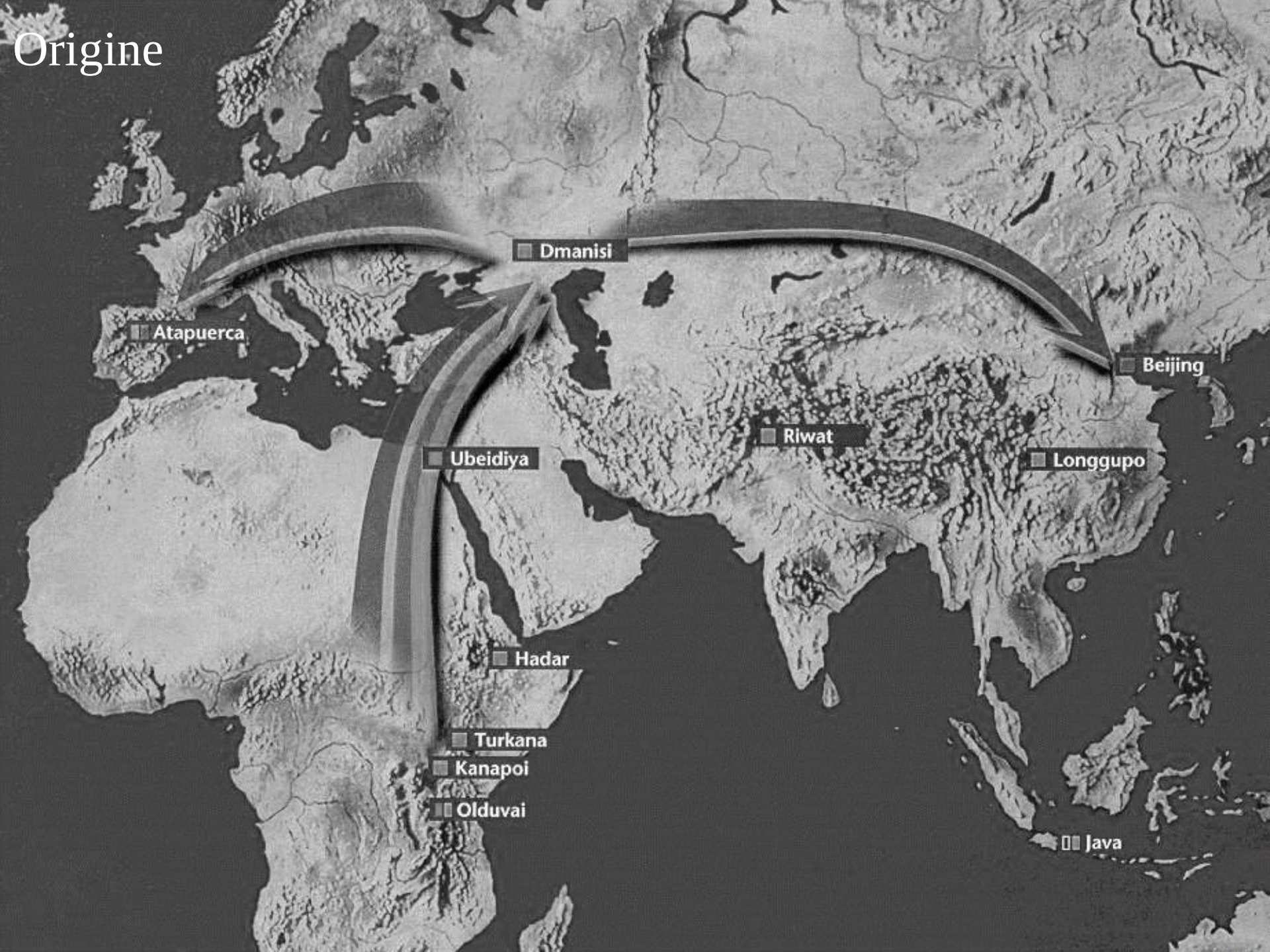
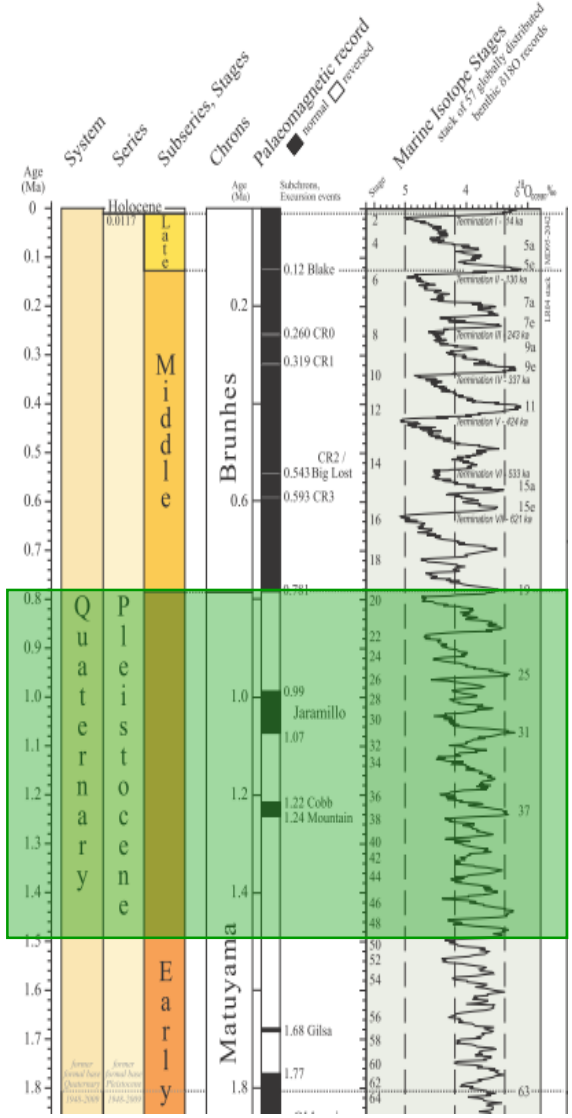
Origine


Dmanisi
Atapuerca
Beijing
Riwat
Ubeidiya
Longgupo
Hadar
Turkana
Kanapoi
Olduvai
Java

Origine : Prime testimonianze del popolamento europeo

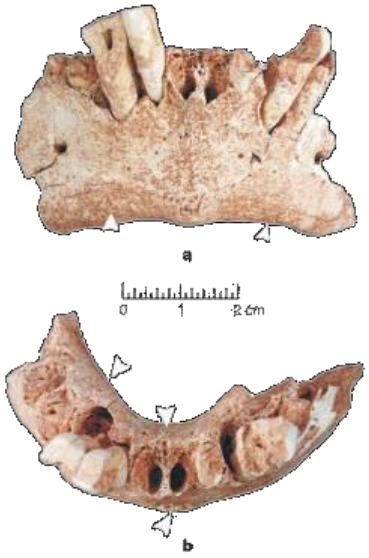


(Cohen & Cibbard, 2010)

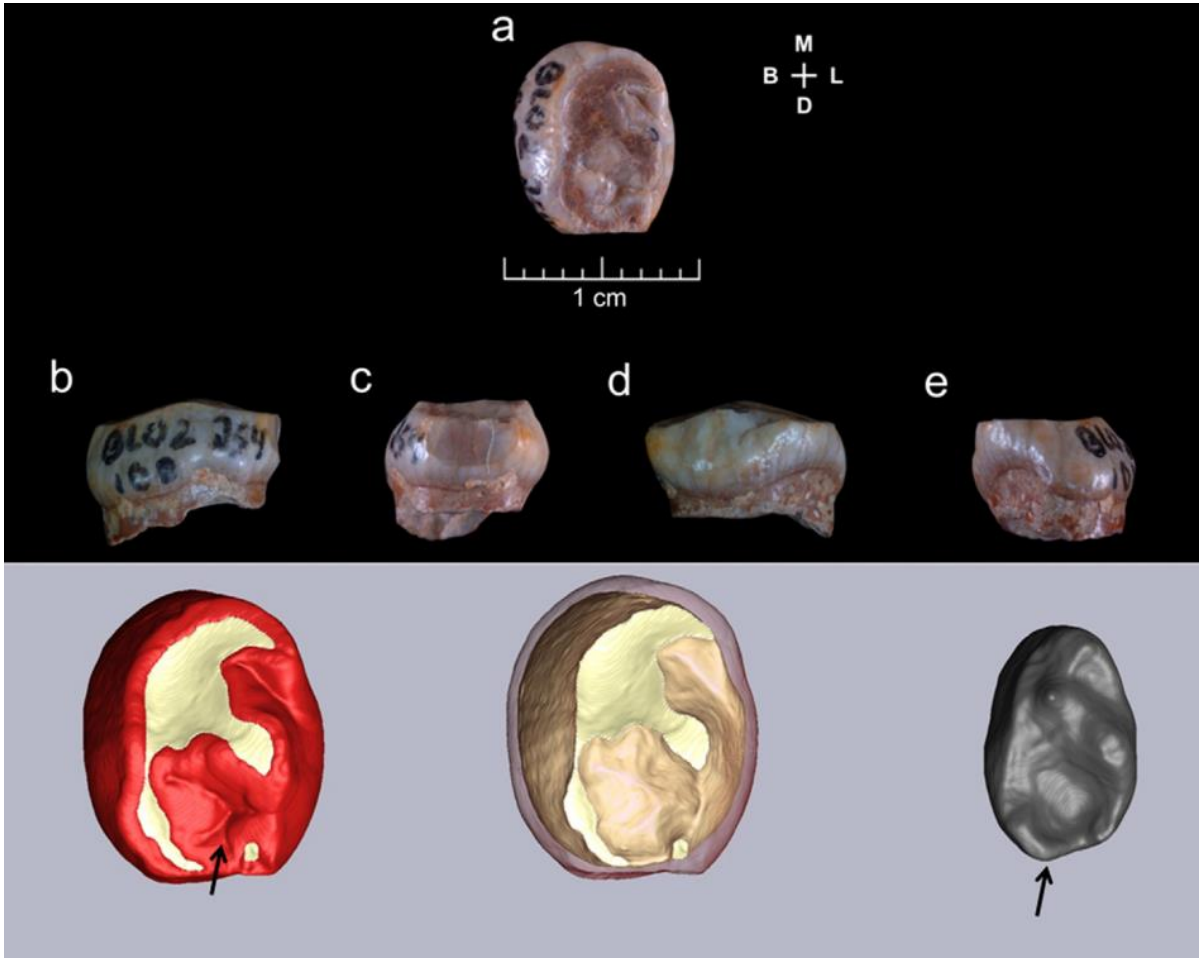
Le prime testimonianze

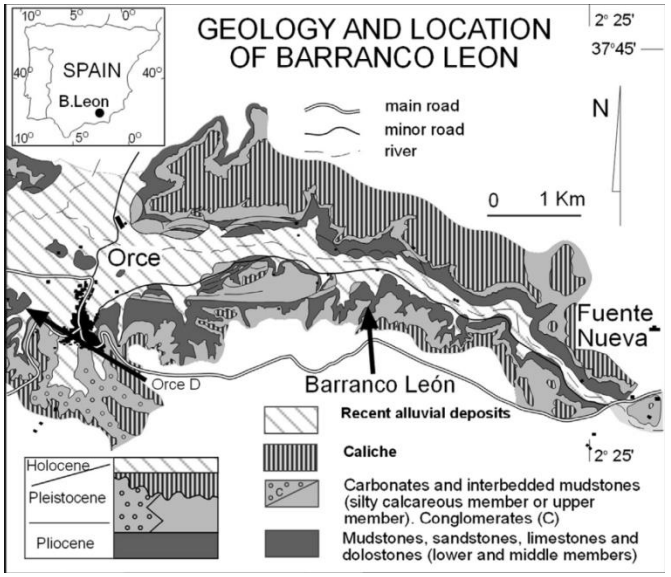
Anteneandertaliani : non hanno acquisito nessuna delle apomorfie dei neandertaliani
Ante-Neanderthals: they didn't acquired none of Neanderthals apomophies

Gran Dolina
Homo antecessor 0,8
Myr (TD6)



Sima del Elefante
Homo sp.
1,3 Myr (Mandible ATE9-1)





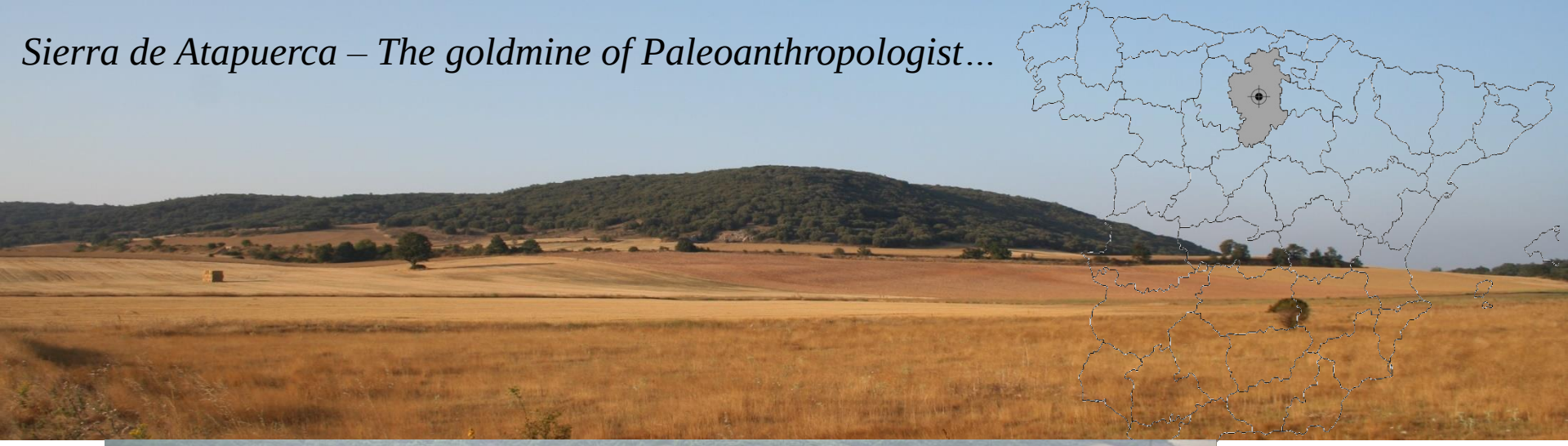
dm1 di Barranco Leon BL02-J54-100
ESR: 1.02 e 1.73 Ma
Paleomagnetismo: 1.07 – 1.77 Ma
Biocronologia: 1.4 Ma

Questo ritrovamento associato ad un importante insieme litico conferma che l'Europe occidentale è stata colonizzata poco dopo la prima espansione out of Africa, documentata da Dmanisi

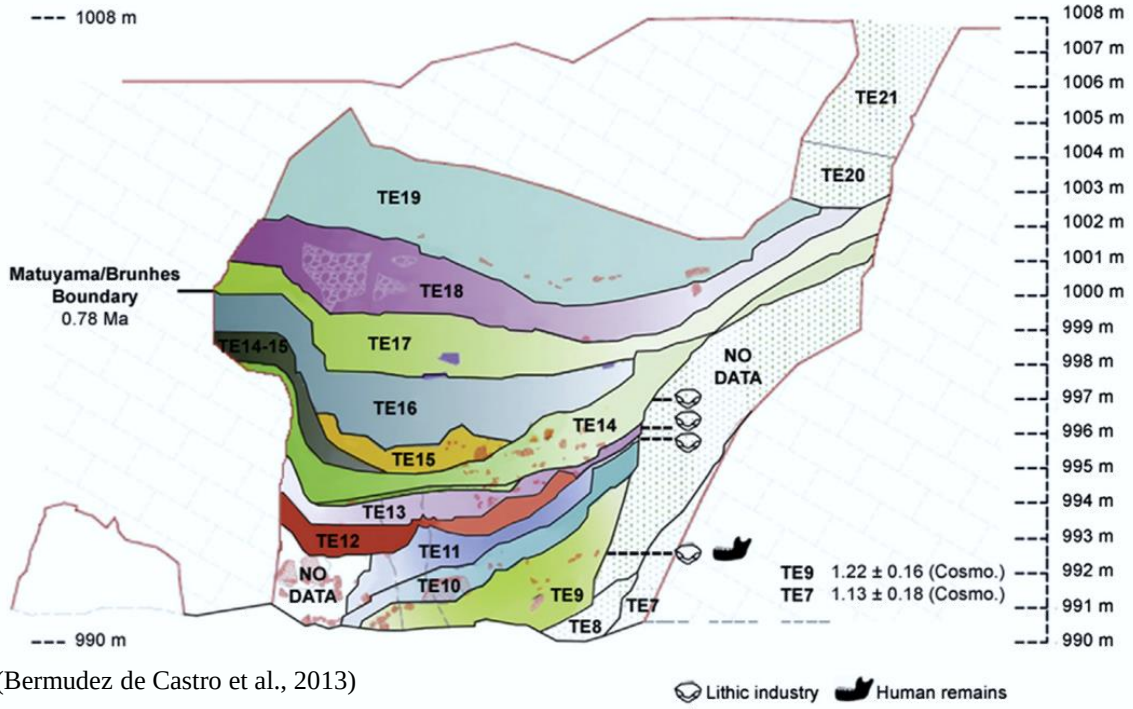
This finding combined with the important lithic tool assemblage confirms that Western Europe was colonized soon after the first expansion out of Africa, currently documented at the Dmanisi site.

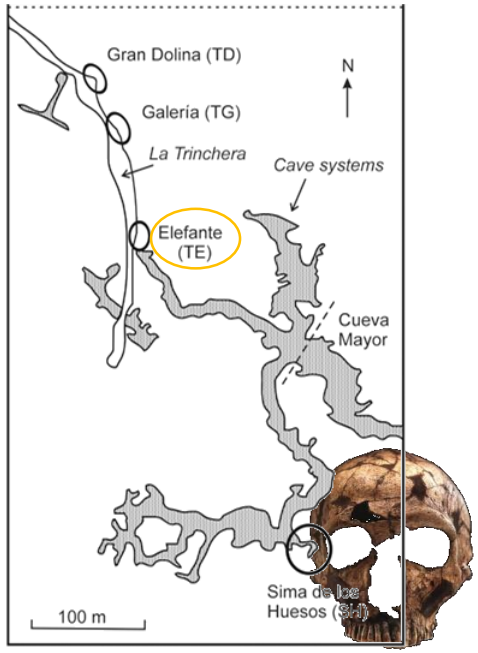
Toro-Moyano, 2013. JHE 65

Sierra de Atapuerca – The goldmine of Paleoanthropologist…

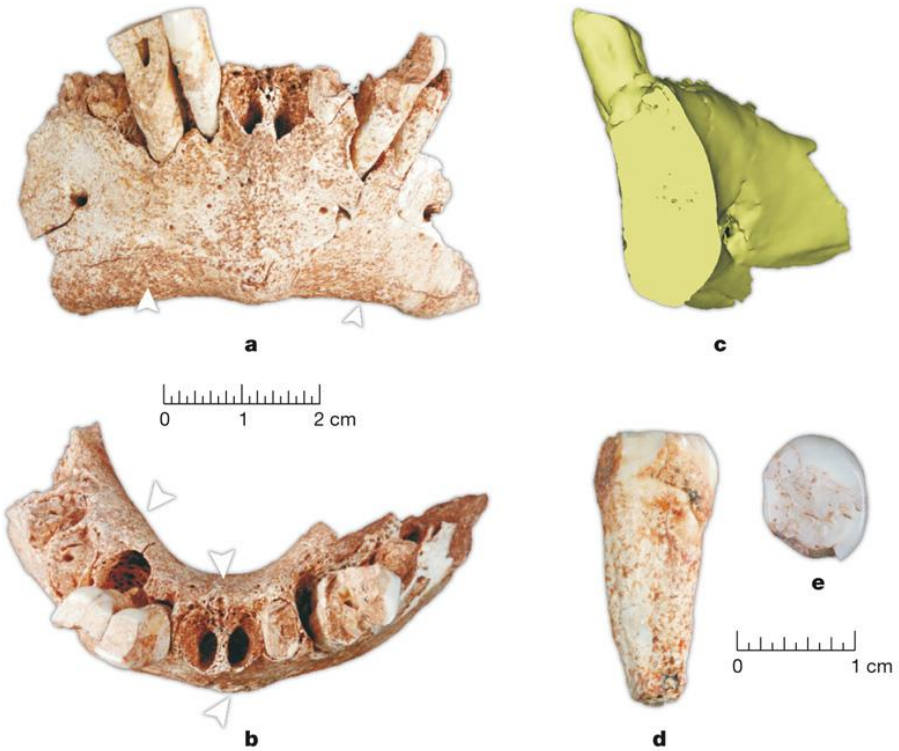


Sima del Elefante





(Bermudez de Castro et al., 2013)



(Carbonell et al., 2008)

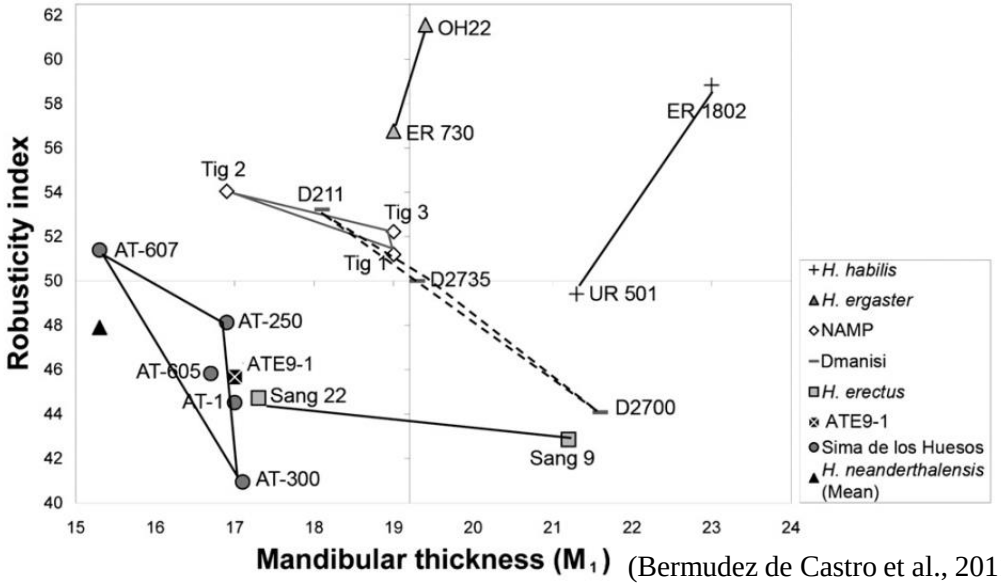
Primitive traits for the genus *Homo*:

- Anterior marginal tubercle below C/P3
- Weakly express mentum osseum
- Distinct mental trigone
- Presence of incisura submentalis
- Morphology of the premolars

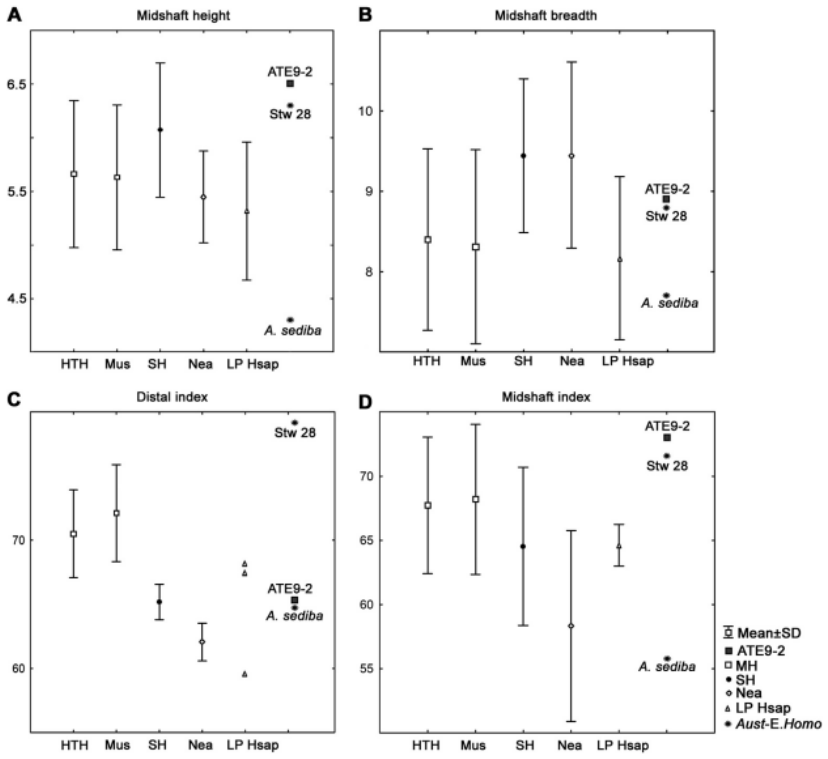
Derived traits relative to African early *Homo*:

- A minimal inclination of the planum alveolare
- Absence of the superior transverse torus
- Limited thickness of the mandibular body

ATE9-1 displays some morphological features that suggest a departure from the variability observed in the Dmanisi and African Pleistocene mandibles, suggesting the early appearance of a "European identity" in the hominin populations who settled this continent.

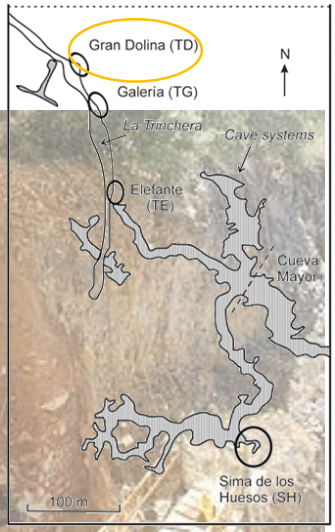


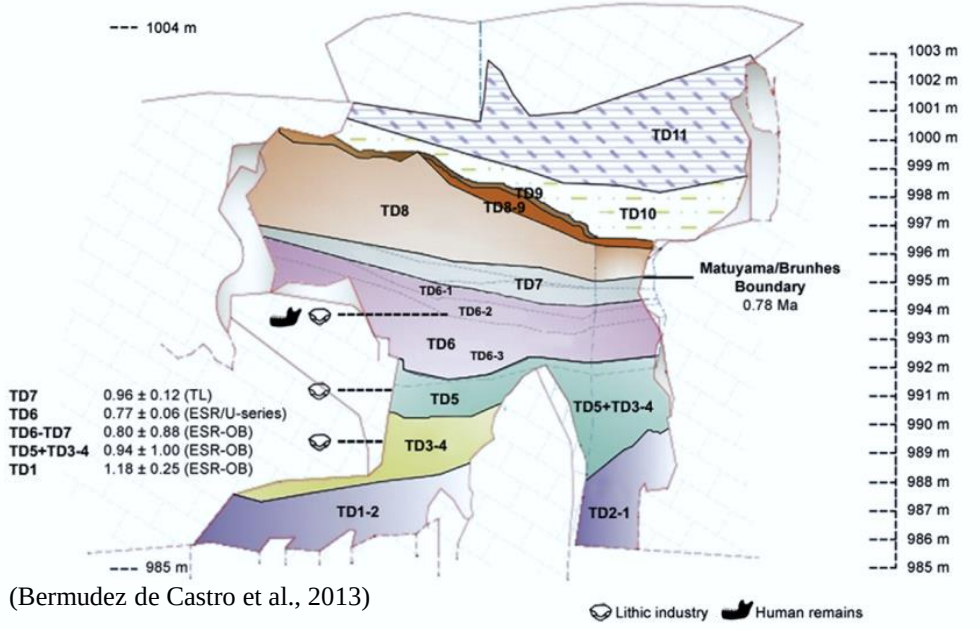
(Bermudez de Castro et al., 2011)



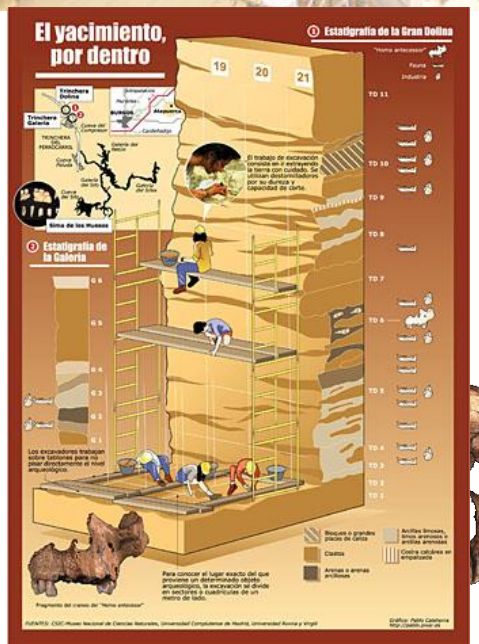
The hand phalanx ATE9-2, attributed to *Homo* sp. Show **no essential differences** between it and the reference collection (Neanderthals, Modern humans, Sima de los Huesos). This suggest that the morphology of the proximal hand phalanges and probably the entire hand could have remained stable over the last 1.2-1.3Ma. (Lorenzo et al., 2014)

Gran Dolina and the *Homo antecessor* hypodigm





(Bermudez de Castro et al., 2013)



Livello TD6 – *c.* 800 ka BP

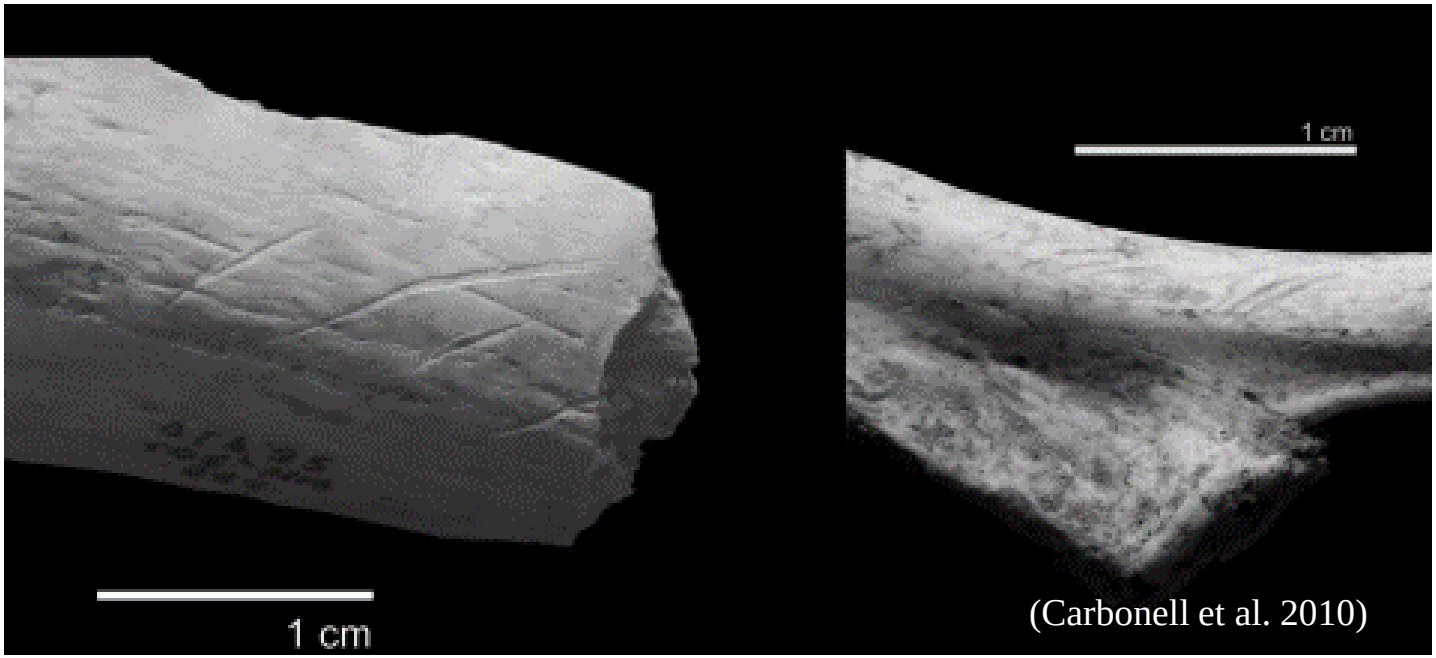
NMI: 2 adulti, 3 adolescenti, 6 bambini

Interpretazione

- cannibalismo gastronomico (Fernandez-Jalvo et al. 1999)
- Cannibalismo culturale (Carbonell et al., 2010)
- Violenza e cannibalismo intergruppo; excocannibalismo (Saladié et al., 2012)

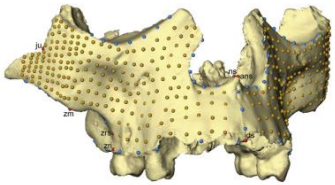
Tracce di macellazione su la diafisi di una tibia, interpretate come tracce di scarnificazione

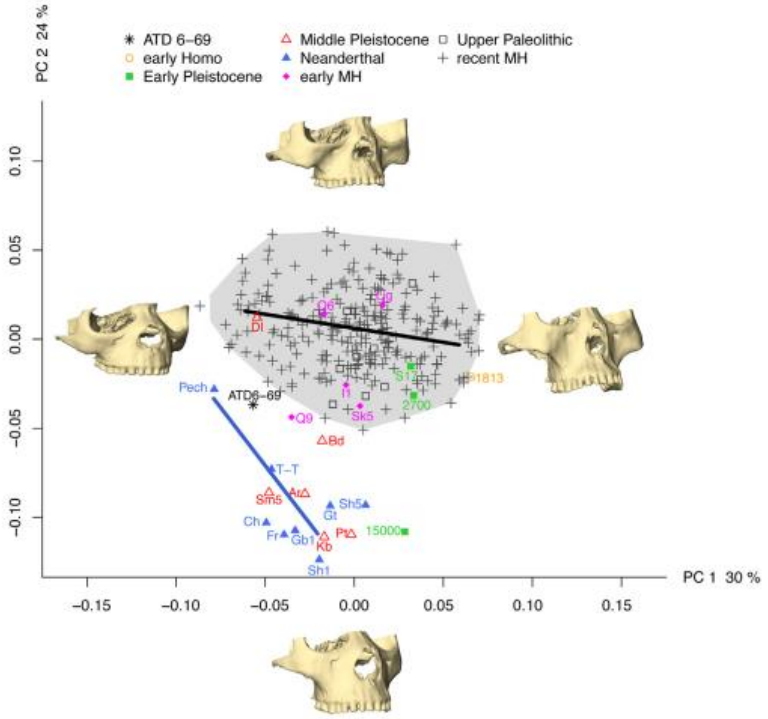
Costola umana con incisione

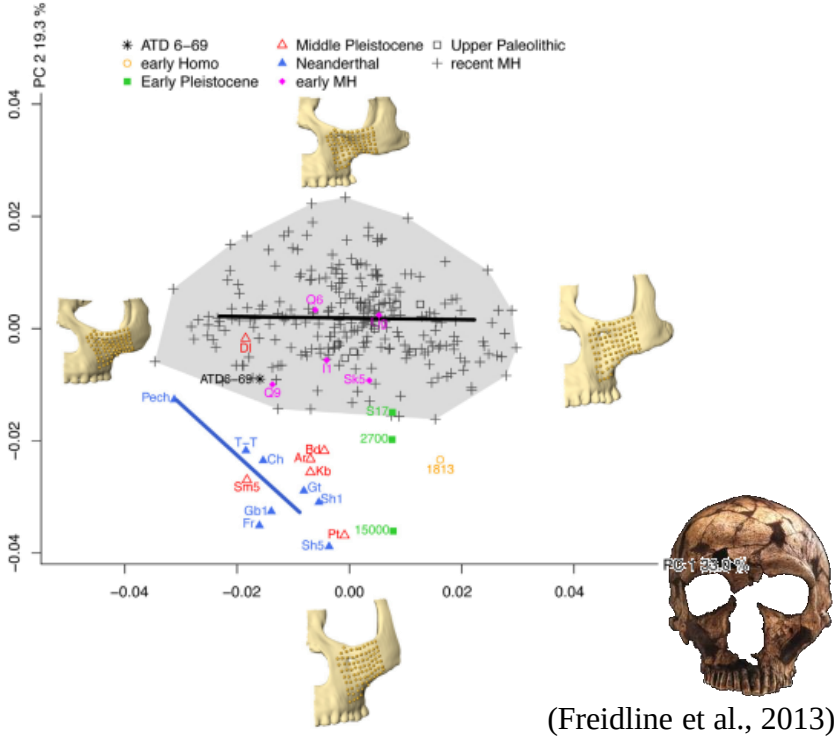


(Carbonell et al. 2010)

The fossil ATD6-69 has been suggested to mark the earliest appearance of modern human facial features. However, this specimen is a subadult and the interpretation of its morphology remains controversial, because it is unclear how developmental shape changes would affect the features that link ATD6-69 to modern humans.







(Freidline et al., 2013)

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ARTICLE

WILEY

Twentieth anniversary of *Homo antecessor* (1997-2017): a review

José María Bermúdez de Castro[1,2*] | María Martinón-Torres[2,3*] | Juan Luis Arsuaga[4] | Eudald Carbonell[5,6]

TABLE 1 List of some of the features observed in *Homo antecessor*

• *Plesiomorphic (primitive) features for the* Homo *clade*
-Fusion of the styloid process to the basicranium
-Nasal floor showing a level and sloping configuration
-Position of the mental foramen at the level of mandibular P_3-P_4
-Low position of the mylohyoid line in relation to the alveolar margin at the mandibular M_3 level
-Parallel trajectory of the mylohyoid line in relation to the alveolar margin
-Shallow relief of the pterygoid fossa
-Lateral intersection between the mandibular notch and the condyle
-Absence of retromolar space
-M_3 partially covered by the mandibular ramus
-Strong tuberculum molare on the deciduous dm^1
-Presence of mesial and lingual styles on the deciduous upper canine
-Buccal faces of the mandibular premolars showing mesial and distal marginal ridges and grooves, which connect with the shelf-like cingulum
-Crown shape of the mandibular P_3 is strongly asymmetrical, with a remarkable talonid and a large occlusal polygon
-Mandibular P_4 showing an asymmetrical outline, with a mesially displaced metaconid extended talonid, and a broad occlusal polygon
-Mandibular P_3 and P_4 showing a complex root system (2R: MB+DL)^1 formed by a mesiobuccal (MB) plate-like root with two pulp canals and a distolingual (DL) root with a single canal
-M1<M2 for both upper and lower molar series.
-Mandibular M_1 and M_2 exhibiting a Y-pattern of the buccal and lingual grooves separating the five principal cusps
-Enamel of the occlusal surface of the postcanine teeth is moderately or remarkably crenulated
-Absolutely and relatively long radial neck

• *Apomorphic (derived features), shared with later hominins*
-Doubled arched supraorbital torus
-Parietals showing parasagittal flattening of the upper surfaces
-Position of the lateral prominence at the level of the talonid of mandibular M_2
-Absence of alveolar prominence
-Oblique inclination of the trigonum postmolare
-Shallow relief of the masseteric fossa
-Moderately hollowed posterior subalveoloar fossa
-Regular gonion profile
-Length/width index of the mandibular alveolar arcade clearly below 100 (following Rosas and Bermúdez de Castro[47])
-Permanent mandibular incisors buccolingually expanded with respect to *H. habilis* s.s. and other African and Eurasian Early Pleistocene hominins such as KNM ER 992 or Dmanisi
-P3>P4 size sequence for the crown area of the maxillary and mandibular premolars
-Postcanine teeth smaller than those of *H. habilis* s.s. and within the range of *H. ergaster* (or African *H. erectus*), *H. erectus* s.l., and European Middle Pleistocene hominins.
-Mandibular M_3 noticeably reduced with respect to M_1 and M_2
-Antero-medially facing radial tuberosities

• *Derived features, shared with Neandertals and modern humans*

-Convex superior border of the temporal squama[2]

-Anterior position of the incisive canal, which is nearly vertical

- Absence (or weak) planum alveolare

• *Derived features shared with modern humans*

-Modern-like mid-facial topography: infraorbital surface coronally oriented and sloping downward and backward (true canine fossa) with a horizontal and high rooted inferior border

- Medial position of the deepest point of the mandibular notch

-Relatively narrow patellae with high patellar indices

• *Derived features shared with Neandertals and the SH hominins*

-Presence of a medial pterygoid tubercle

-Rhomboidal and compressed occlusal polygon and a skewed external outline of the permanent M^1 with a bulging protrusion of the hypocone

-Permanent upper incisors showing a shovel shape,[3] particularly marked in I^2

- Large olecranon fossa and very thin medial and lateral pillars

-Clavicle absolutely very long (maximum length), relatively slender (low robusticity index), with pronounced shaft curvature and relatively small ephiphyses[4]

- Relatively narrower trochlea of the talus[4]

- Presence of middle trigonid crest

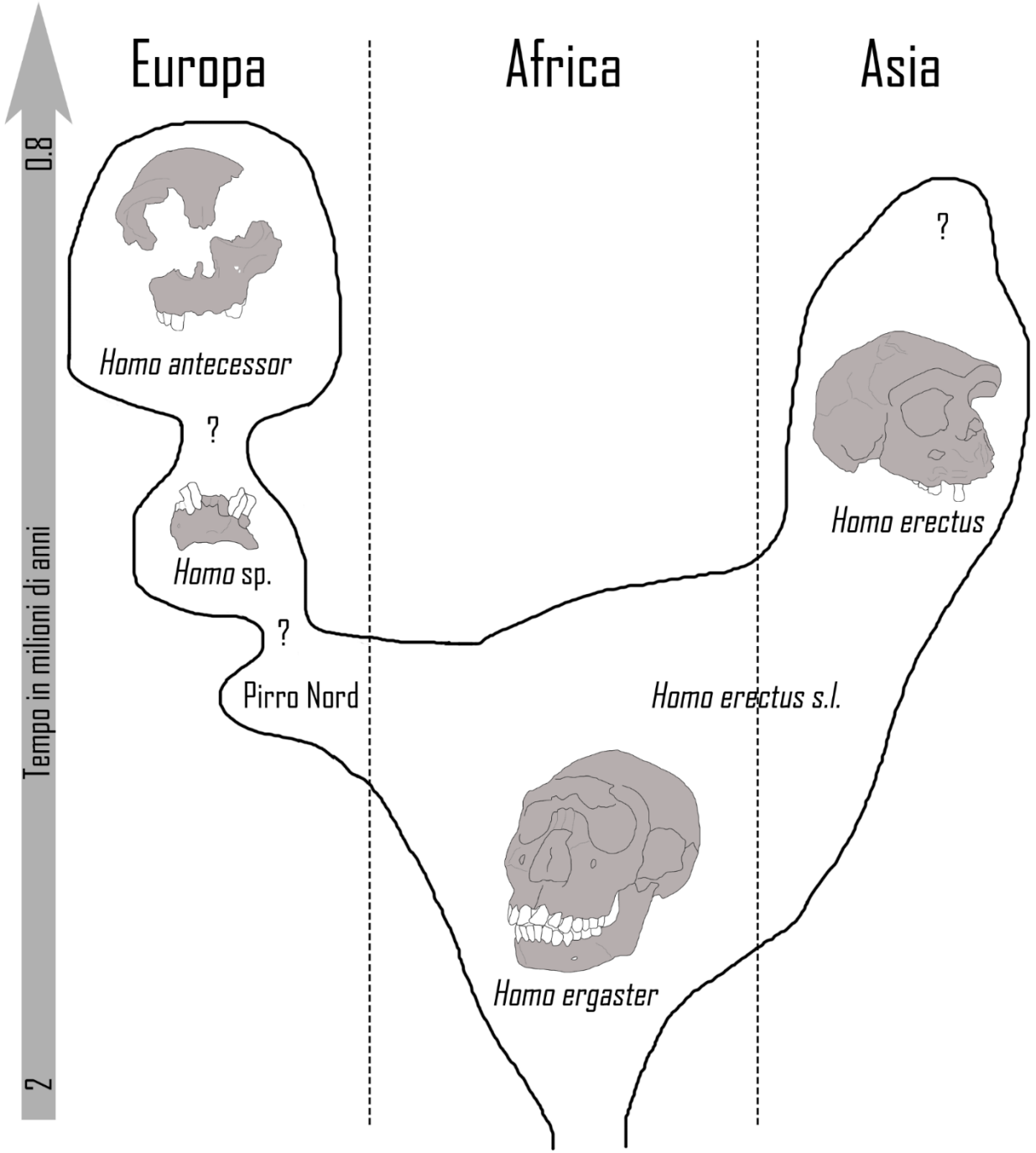
All these features have been studied by some authors.[1,5,23,27,34,35,40,45,46,48,49,54,57,59,63,65,67,123] In these studies, more detailed descriptions and discussions of the polarity of the TD6 features can be found.

1. According to the Wood et al.[124] classification.[124]

2 This feature as also present in African and later Asian Middle Pleistocene fossils.[27]

3. This feature is also common in other Middle Pleistocene Eurasian hominins.

4. These features are found in Neandertals, but not in the SH hominins.[67]


Europa
Africa
Asia
2
0.8
Tempo in milioni di anni
Homo antecessor
?
Homo sp.
?
Pirro Nord
?
Homo erectus
Homo erectus s.l.
Homo ergaster

I « Preneandertaliani »

I Preneandertaliani : Si cominciano ad individuare alcune apomorfie.
Le prime caratteristiche morfologiche di tale popolazione si osservano attorno a 350-400.000 anni fa, sui fossili dell'Arago (Francia) e di Sima de los Huesos (Spagna).
Some apomorphies start to be individualized. The first morphological features of this kind of population are observed around 350-400 000 years.

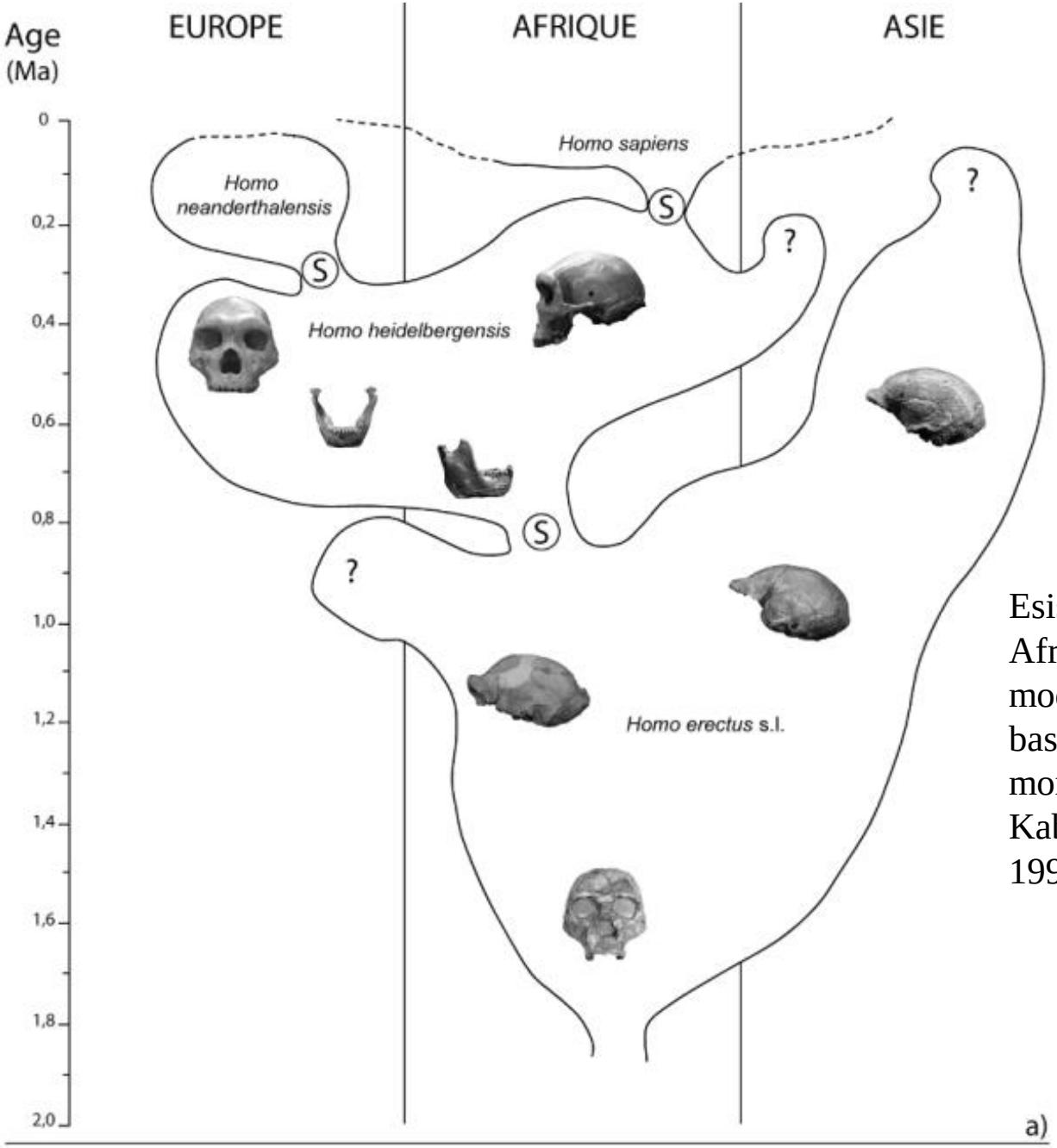
Arago 21

Atapuerca 5

L'Homo heidelbergensis presenta un mosaico di caratteri.
I caratteri derivati compaiono in un modo discontinuo, ma sono sistematicamente rappresentati negli ultimi Neanderthal.
The Homo heidelbergensis *presents a mosaic of features.*
The derived features appeared in an discontinued mode, but they are systematically represented in the last neandertal.

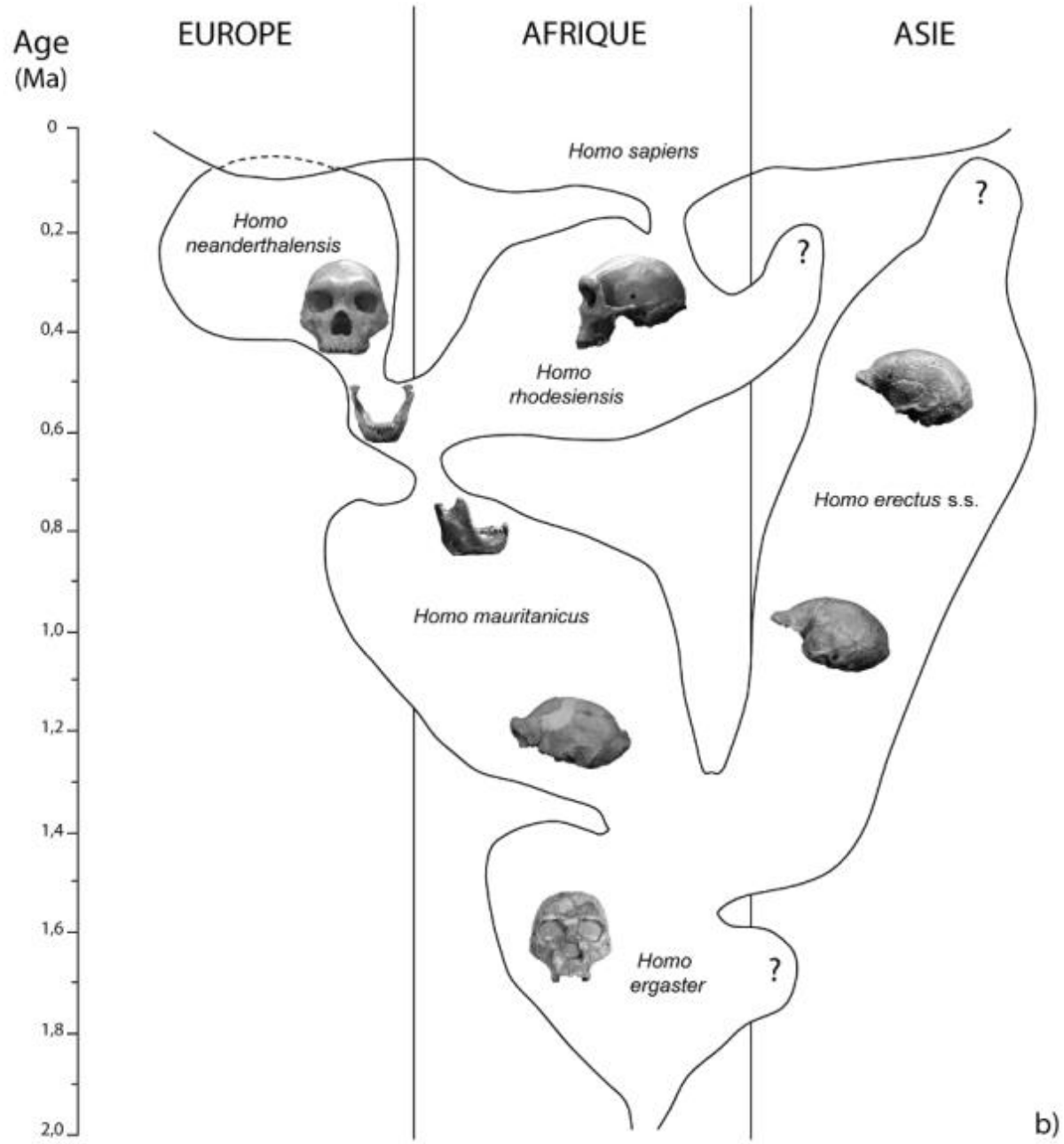
Principali siti con resti umani attribuiti ad *Homo heidelbergensis*

Ipotesi Evolutive: Origine Afro-europea



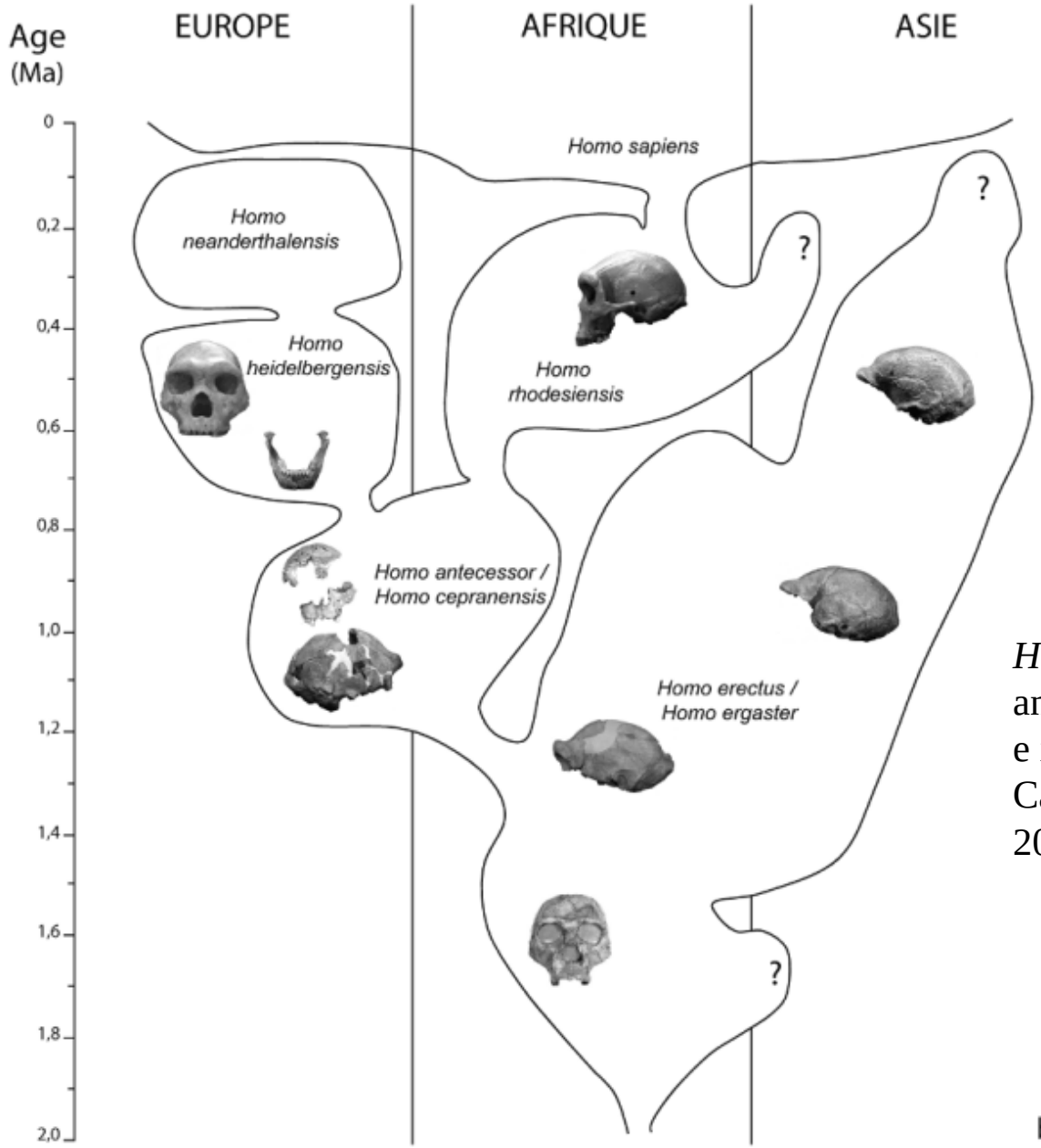
Esistenza nel P. medio di un taxa Afro-europeo ancestrali ai uomini moderni e ai Neandertaliani = basato sulle assomiglianze morfologiche tra Petralona Kabwe e Mauer. (Rightmire, 1998)

Ipotesi Evolutive: Origine Afro-europea

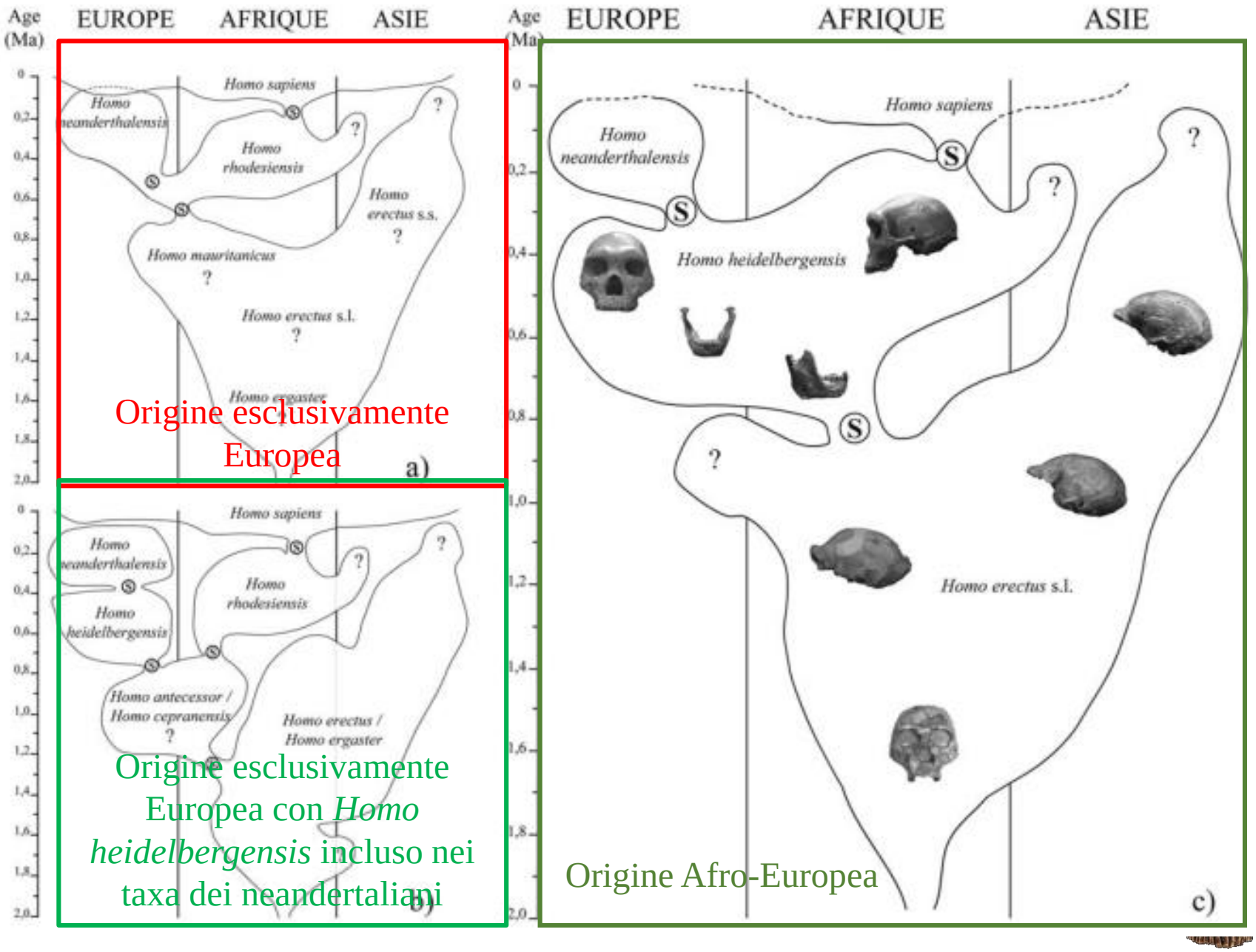


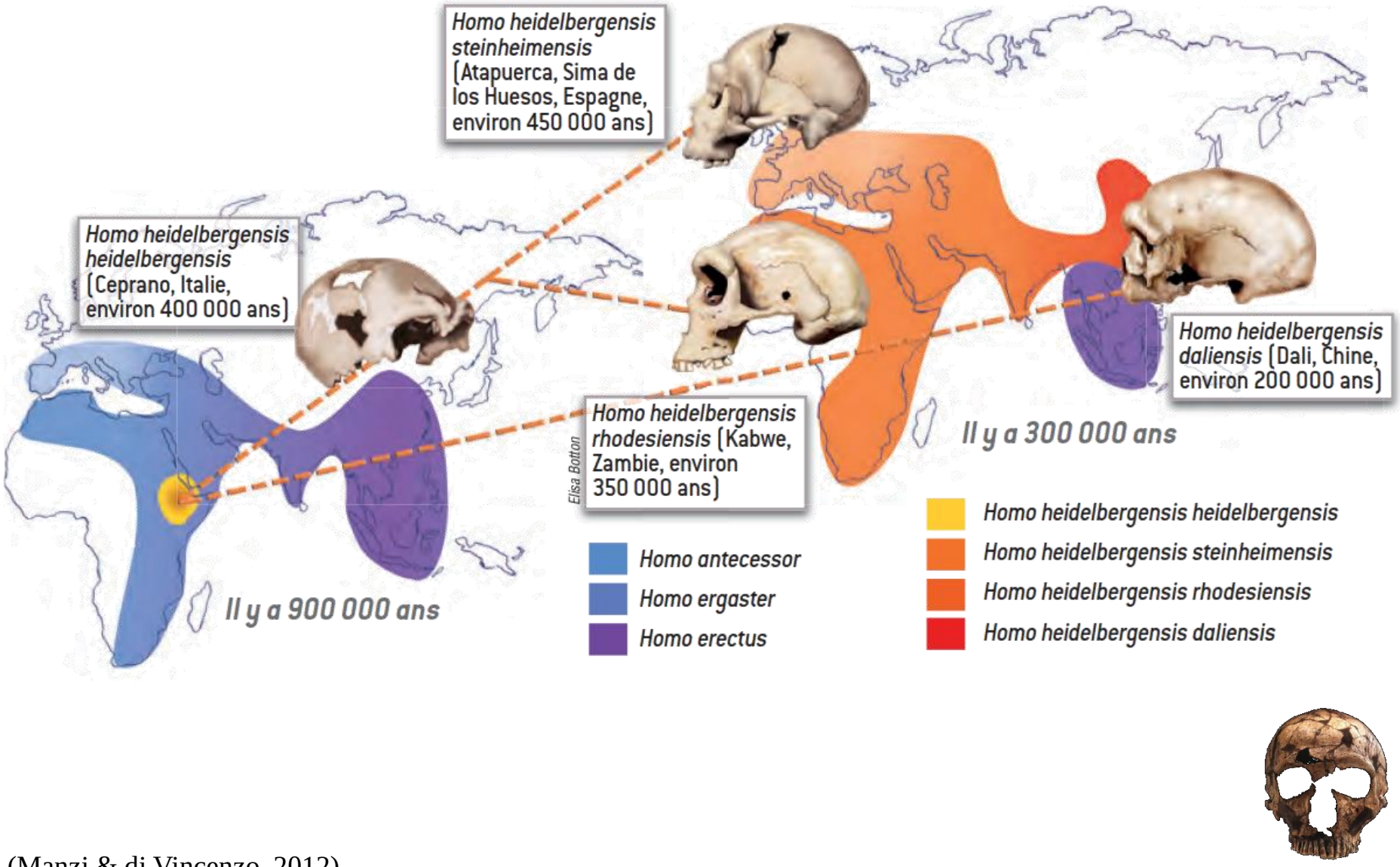
La presenza di caratteri Neandertaliani nella mandibola di Mauer giustifica la sua inclusione nella linea neandertaliana e quindi l'abbandono del nome *H. heidelbergensis* e l'introduzione del *H. mauritanicus* rappresentato dai resti di Tighenif e designato come l'ultimo antenato comune ai neandertaliani e i uomini moderni (Hublin, 2001)

Ipotesi Evolutive: Origine esclusivamente Europea

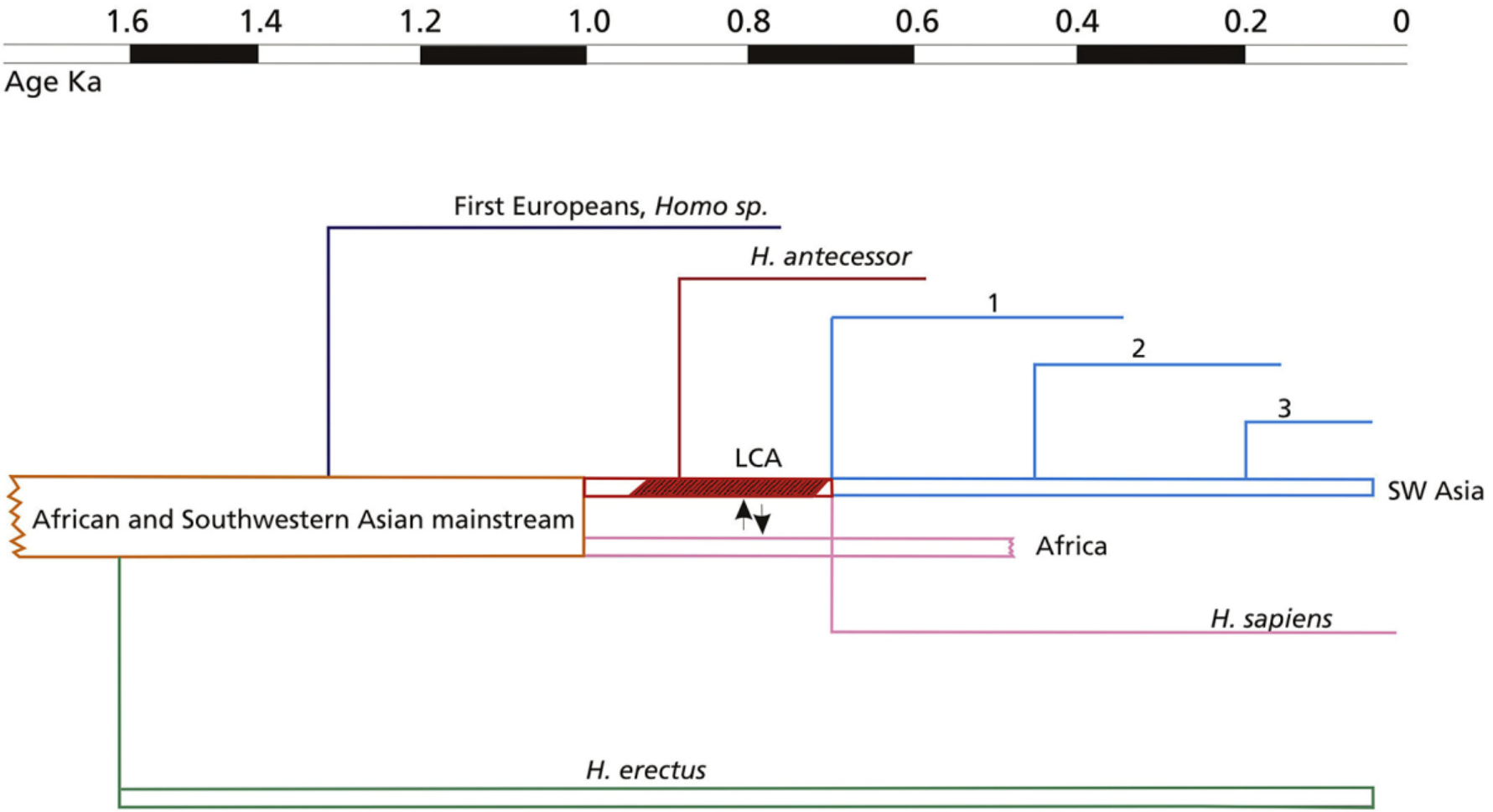


H. antecessor sarebbe l'ultimo antenato comune tra i neandertaliani e i uomini moderni (Bermudez de Castro et al., 1997; Mallegni et al., 2003)


Age (Ma)
EUROPE
AFRIQUE
ASIE
Homo sapiens
Homo neanderthalensis
Homo rhodesiensis
Homo erectus s.s.
Homo mauritanicus
Homo erectus s.l.
Homo ergaster
a)
Origine esclusivamente Europea
Homo heidelbergensis
Homo antecessor / Homo cepranensis
Homo erectus / Homo ergaster
b)
Origine esclusivamente Europea con *Homo heidelbergensis* incluso nei taxa dei neandertaliani
c)
Origine Afro-Europea



(Manzi & di Vincenzo, 2012)



H. antecessor = European branch closely related to the LCA Neandertal and MH
H. heidelbergensis removed of the hominin phylogeny
European Middle Pleistocene specimens could be included in two or more branches of the Neanderthal clade

Bermudez de Castro et al. (2016)

Homo neanderthalensis

Definizione dei Neandertaliani s.s.

L’uomo di Neanderthal si caratterizza per la presenza di:

The Neandertals are characterized by the presence of:

- **Caratteri arcaici / Plesiomorfie** : dei caratteri ancestrali che non si ritrovano in nessun fossile moderno.

  Archaic features / Plesiomorphies: These are ancestral features which are not found in the modern fossil.

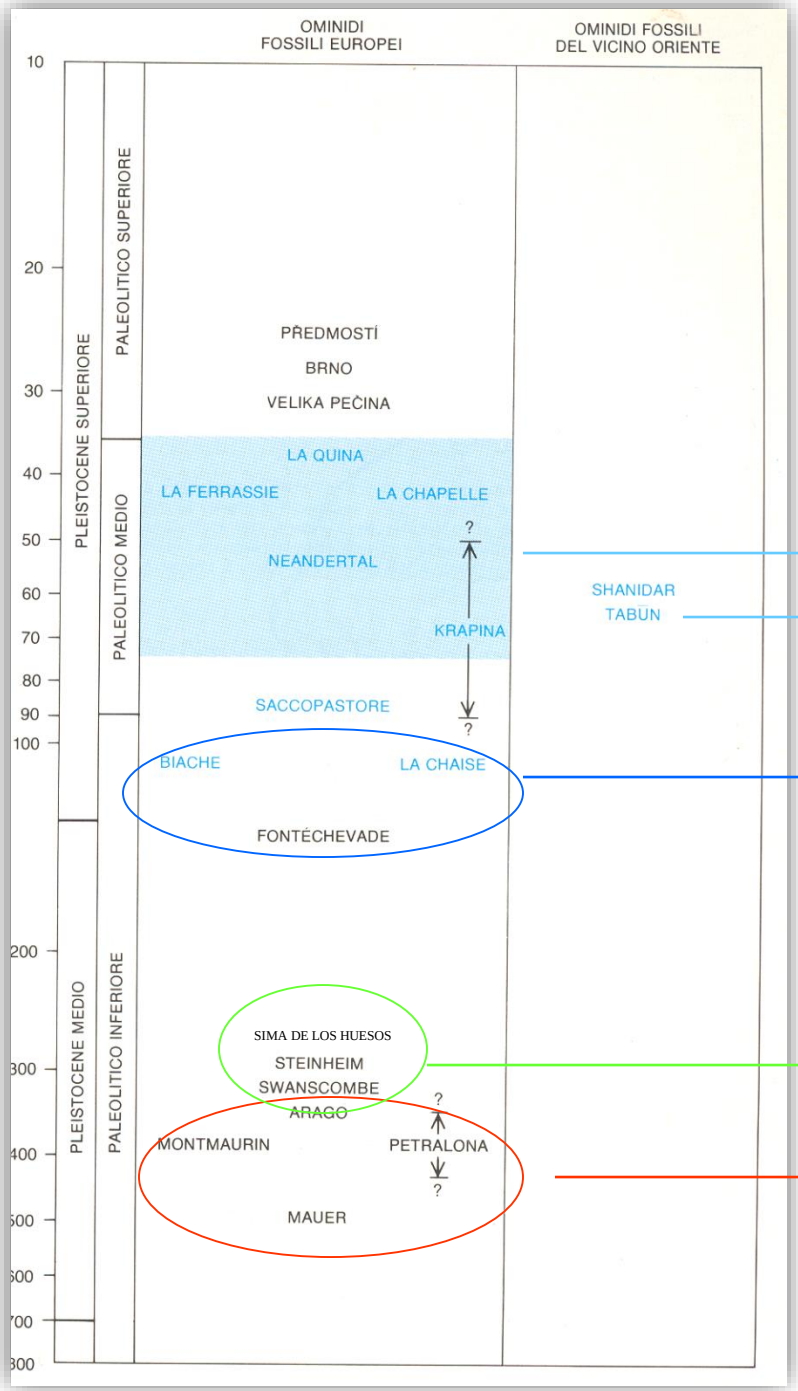
- **Caratteri condivisi** con *Homo sapiens.*

  Feature shared with Homo sapiens

- **Caratteri derivati / Apomorfie** : presenti solo nei Neandertaliani, peculiari ed identificativi di questa specie.

  Derivated features / Apomorphies: These are present only in the Neanderthals, and allow to identify this species.

I Neandertaliani



Neandertaliani classici

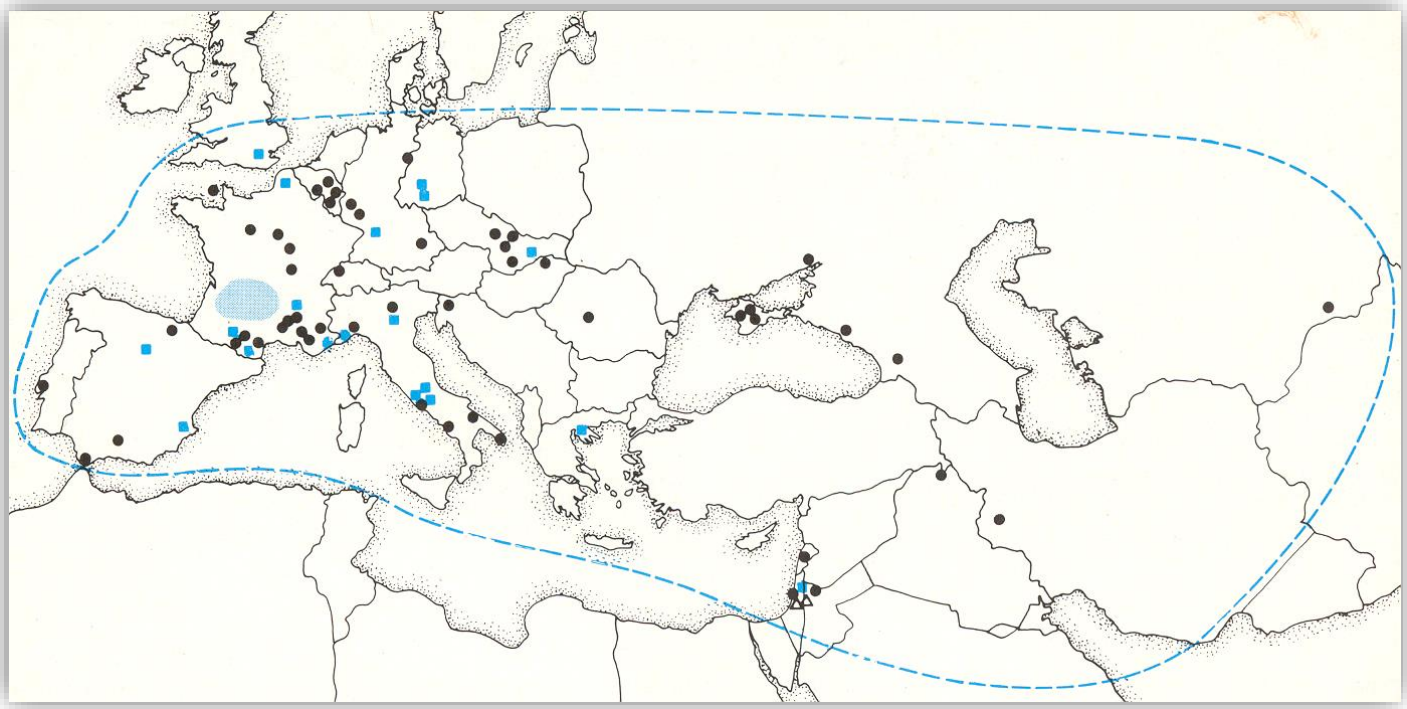
Neandertaliani orientali

III fase (250.000-130.000): stabilizzazione dei caratteri

II fase (400.000-250.000): regione nucale e facciale

I fase (prima di 400.000): regione infraorbitaria e mandibola

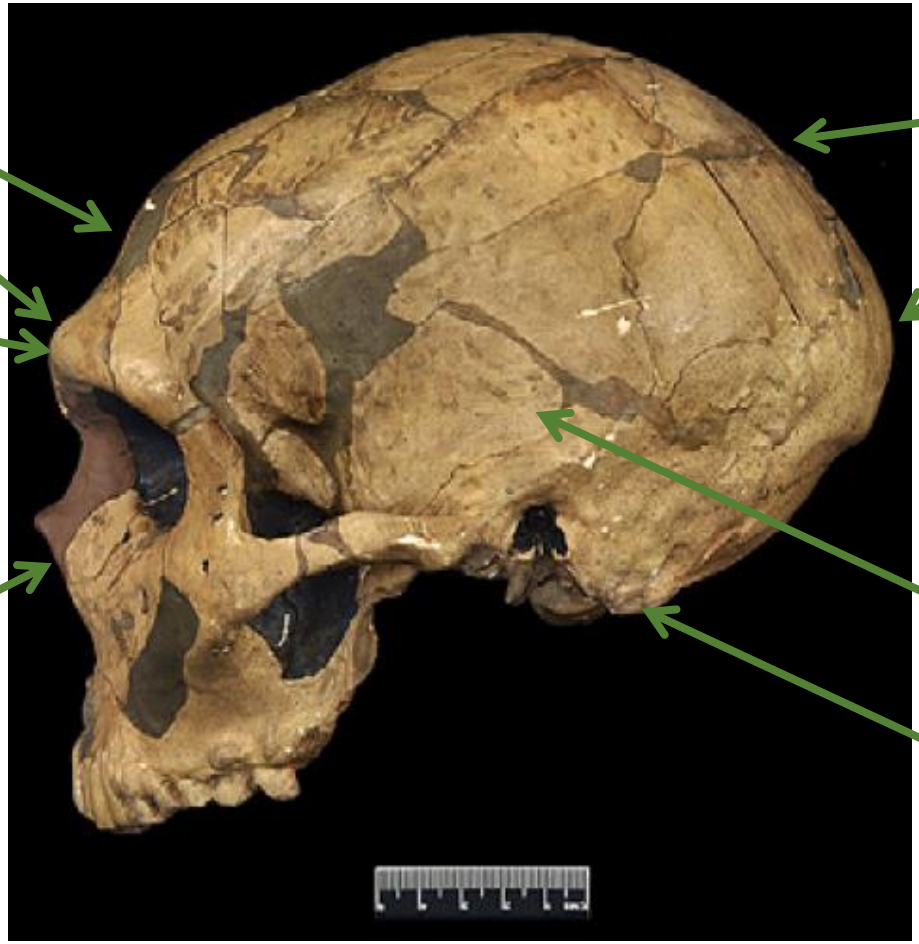
I Neandertaliani



Una speciazione di questi caratteri si osserva nel tempo e nello spazio, infatti i caratteri derivati si mostrano sempre più accentuati man mano che ci si sposta verso Ovest.
→ attorno a 50000 anni in Europa occidentale, gli individui di Neanderthal presentano dei caratteri derivati più pronunciati rispetto agli individui neandertaliani dell'Europea orientale.

A speciation of these features can be observed in time and space. In fact the derived features are more accentuated going toward Western Europe.
→ around 50 000 years in Western Europe, the neandertal present derived features more marked compared to the Neandertal from Eastern Europe.

Grande capacità cranica 1500-1700 cm^3



Frontale sfuggente

Toro sopraorbitario

Glabella sporgente

Naso alto, e proiettato verso avanti = Prognatismo meso-facciale

Occipito-parietale piatto

Occipitale pinzato

Piano nucale e Piano occipitale formano un angolo chiuso

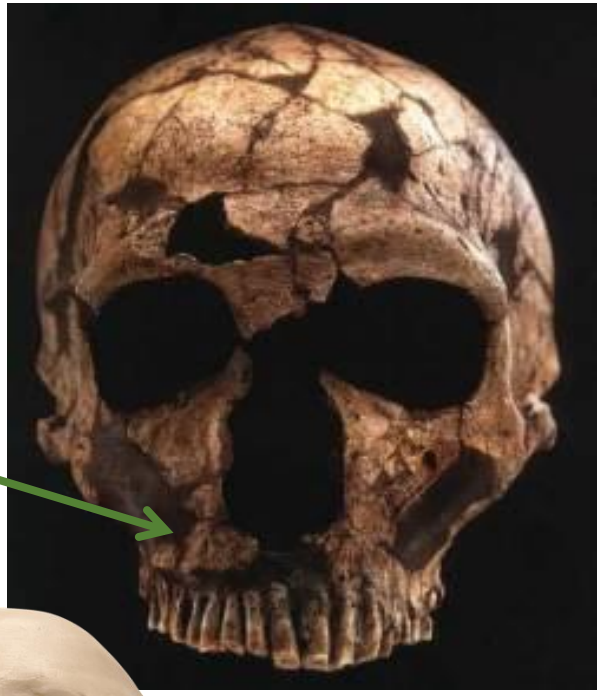
Temporale basso

Apofisi mastoidee piccole e poco sviluppate

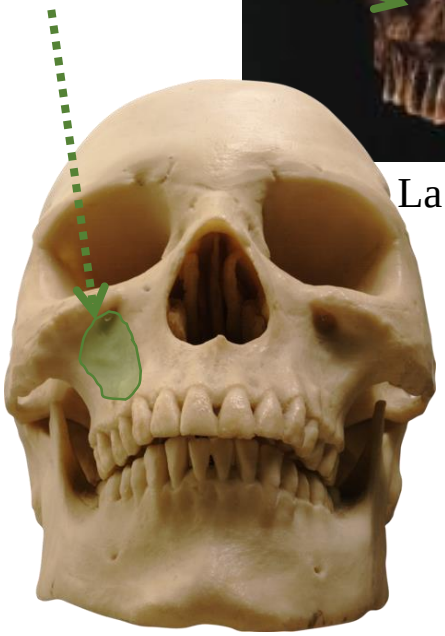
Il cranio cerebrale è allungato per compensare la faccia voluminosa

La Ferrassie 1

Orbite più large che alte, arrotondate e grandi

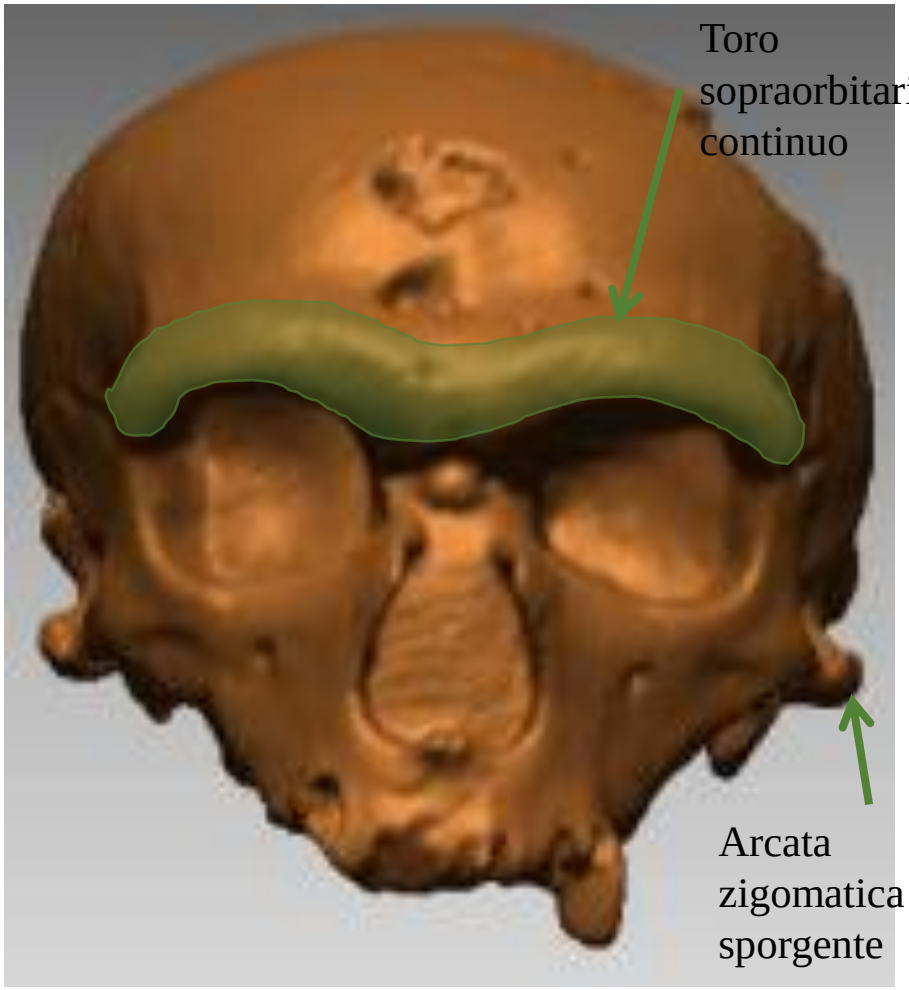


Assenza di fossa canina



La Ferrassie 1

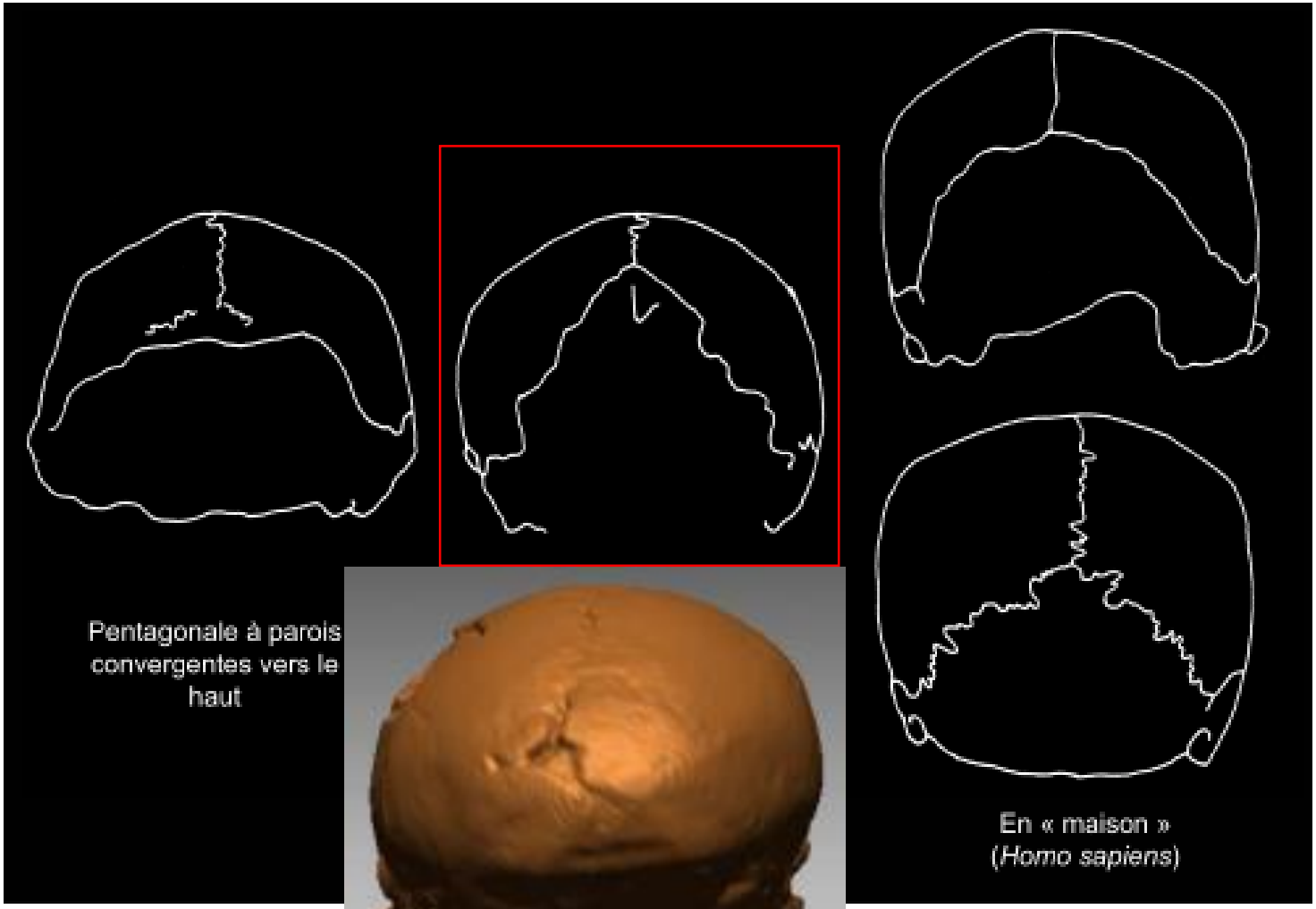
Cavità nasale alta e voluminosa



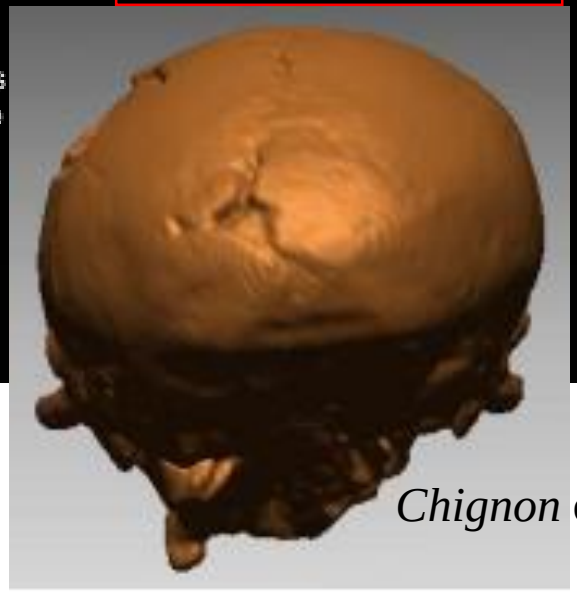
La Chapelle-aux-Saints 1

Forma circolare del cranio in vista posteriore

Circular shape of the cranium in posterior view

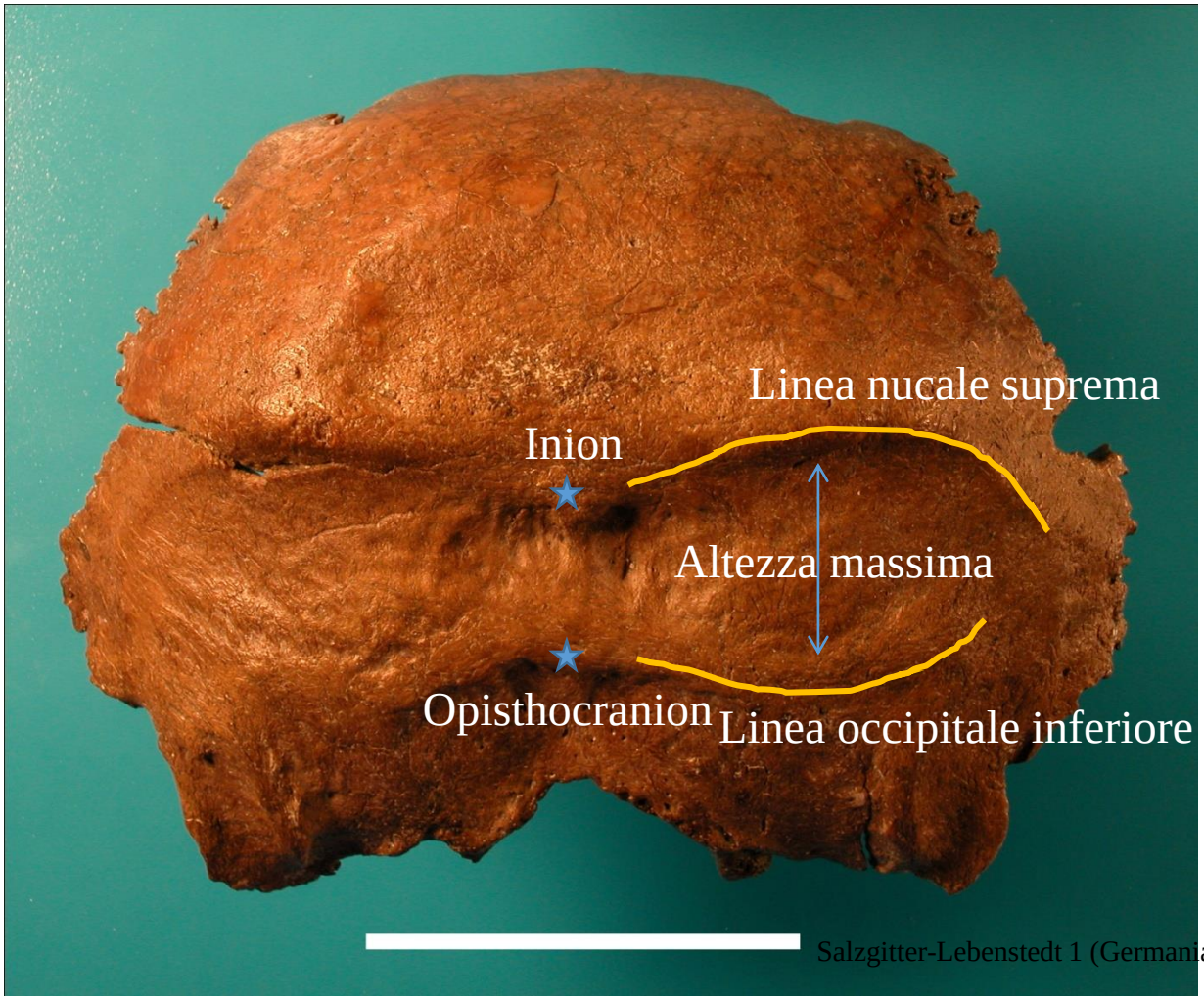


Chignon occipitale

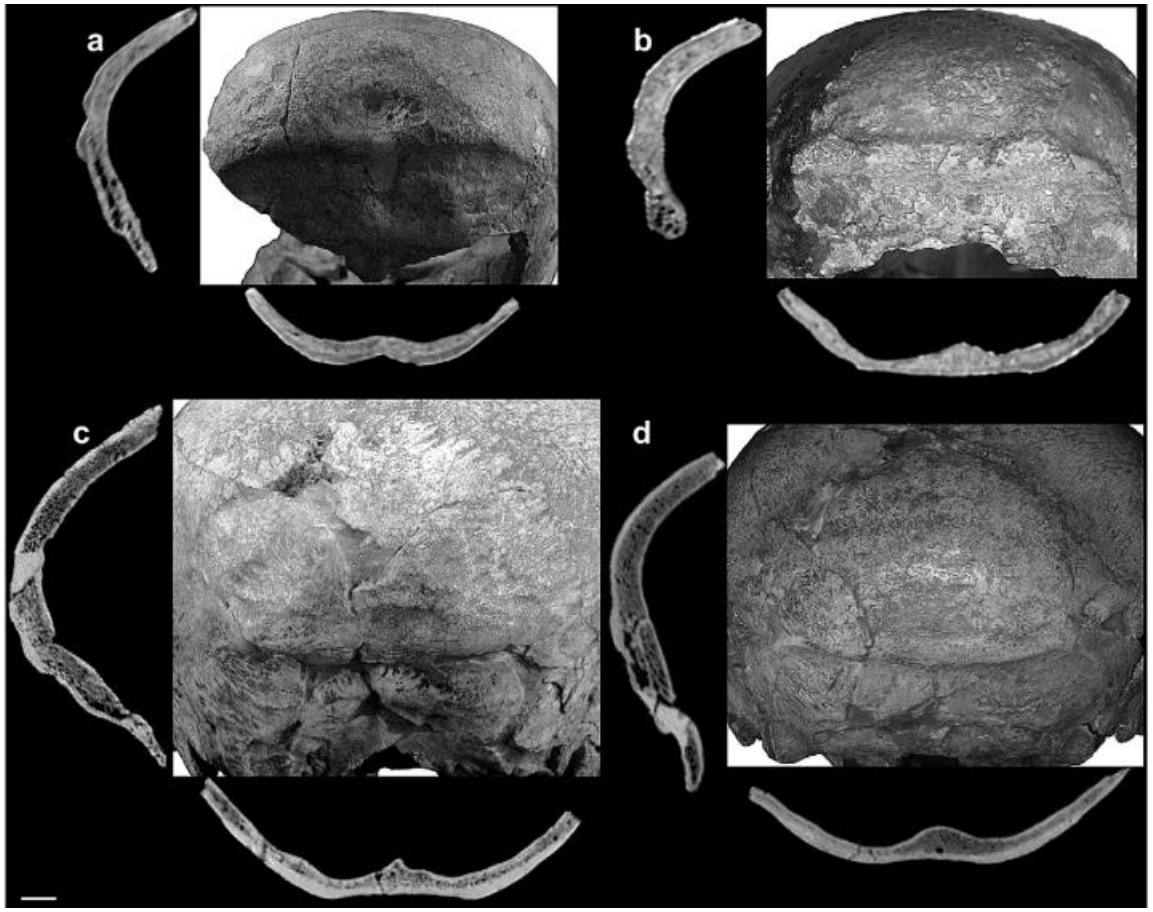


La Chapelle-aux-Saints (Francia)

Fossa soprainiaca / *suprainiac fossa*



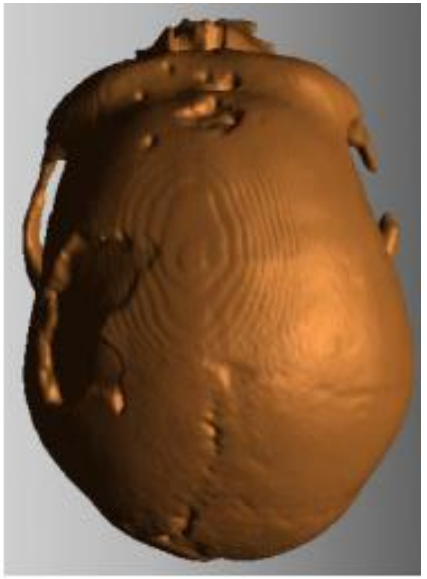
Salzgitter-Lebenstedt 1 (Germania)



a: Gibraltar 1
b: Guattari 1
c: La Chapelle-aux Saints 1
d: La Ferrassie 1

(Balzeau, 2010)

La fossa soprainiaca è un carattere derivato dei neandertaliani che si ritrova in tutti i campioni, si individua già durante i primi stadi di sviluppo ed è presente presto nella differenziazione della linea.
Corrisponde ad un assottigliamento della diploe.



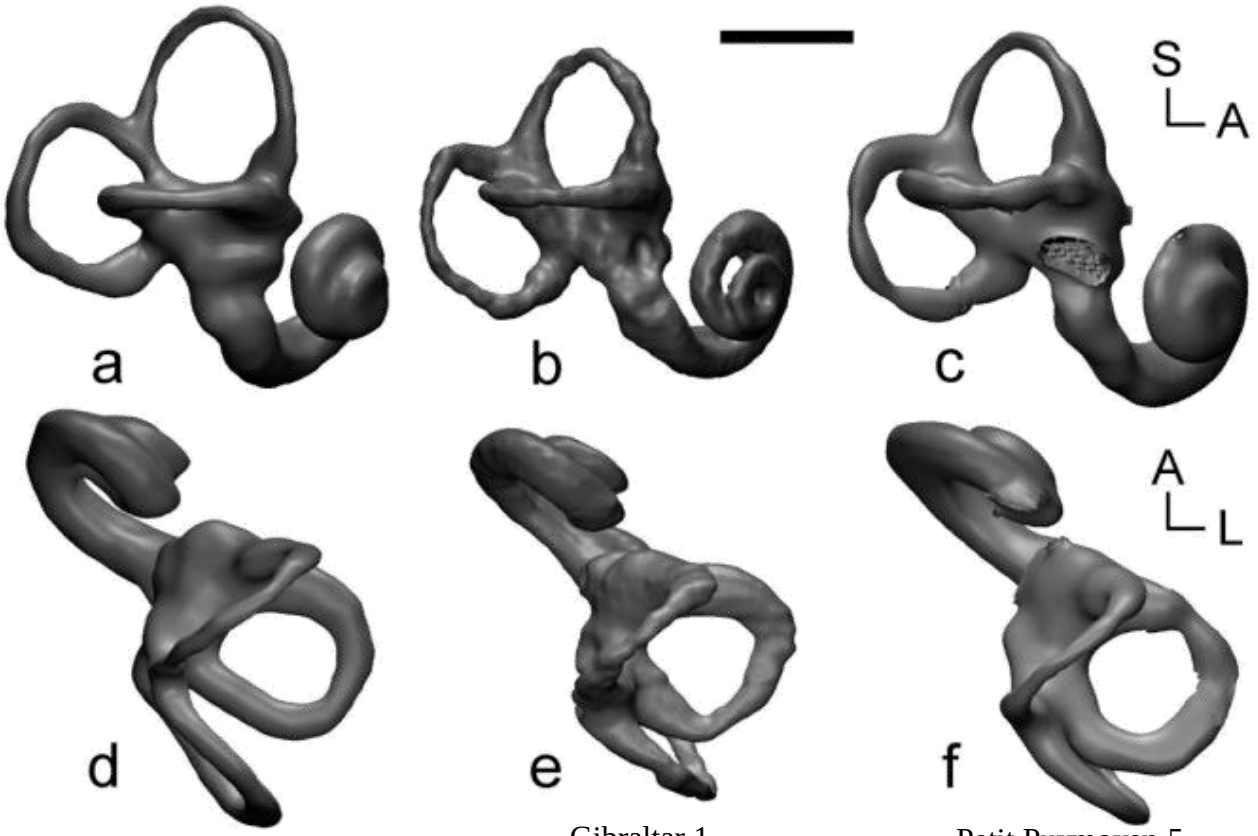
Homo neanderthalensis
(La Chapelle-aux-Saints 1)

Cranio allungato / *elongated cranium*

Zigomi sporgenti / *prominent zygomatic*

Larghezza massima in posizione bassa /
maximum width in a low position

(Spoor, 2003)

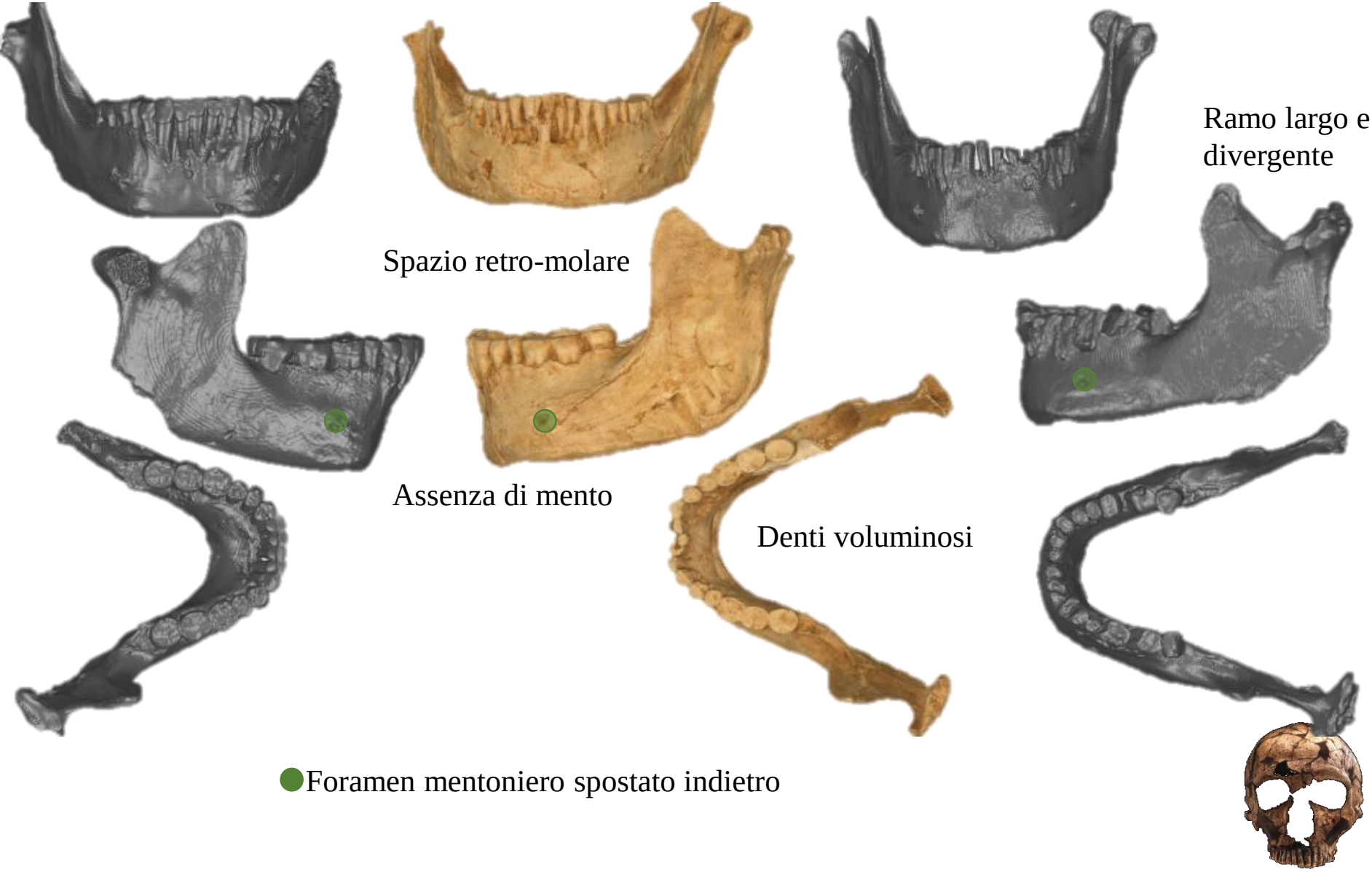


Uomo moderno Gibraltar 1 Petit Puymoyen 5

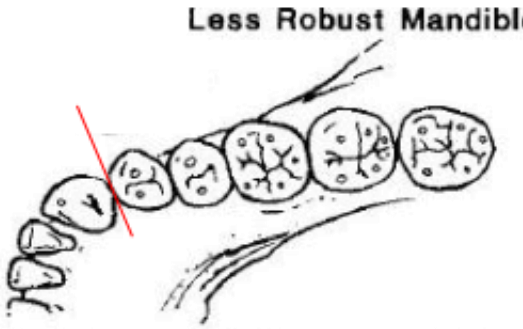
Fig. 2. Lateral (a)–(c) and superior (d)–(f) aspects of the right bony labyrinths of a Holocene human (a), (d), and the Neanderthal specimens Gibraltar 1 (b), (e) and Petit Puymoyen 5 (c), (f), reconstructed from sagittal CT scans. The lateral views are aligned according to the plane of the lateral semicircular canal. S. superior, A, anterior, and L, lateral. Scale bar is 5 mm.

Rispetto all'uomo moderno l'orecchio interno del Neanderthal è caratterizzato da un arco del canale semicircolare anteriore più piccolo nel valore assoluto e relativo, abbastanza appuntito e con più torsioni.

Compared with Holocene humans the bony labyrinth of Neanderthals can be characterized by an anterior semicircular canal arc which is smaller in absolute and relative size, is relatively narrow, and shows more torsion.


Ramo largo e divergente
Spazio retro-molare
Assenza di mento
Denti voluminosi
Foramen mentoniero spostato indietro

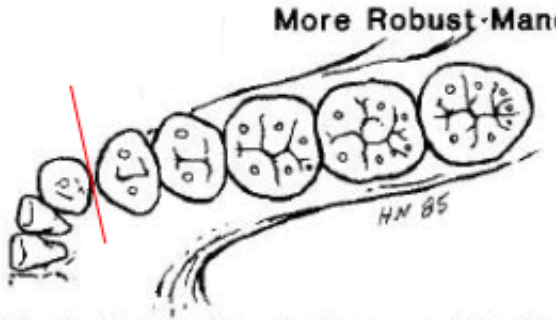
Australopithecus africanus



Relatively Larger Incisors and Canines

Relatively Smaller Premolars and Molars

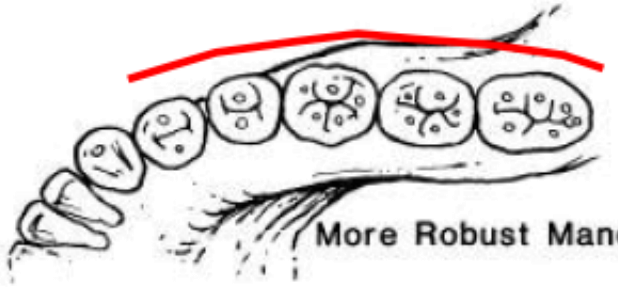
Paranthropus



Relatively Smaller Incisors and Canines

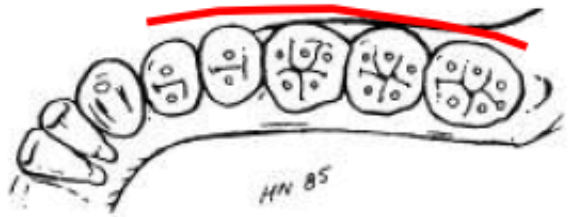
Relatively Larger Premolars and Molars

Homo habilis



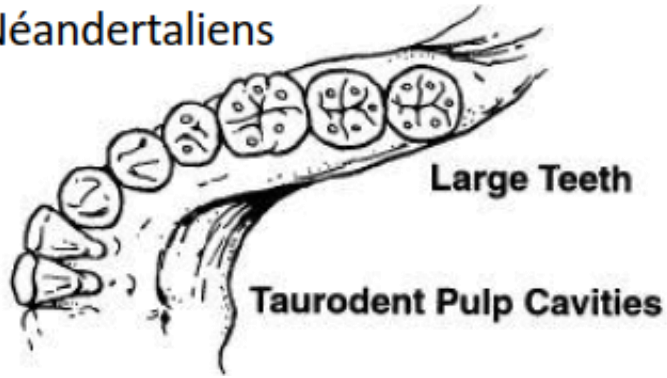
Larger Premolars and Molars

Homo erectus

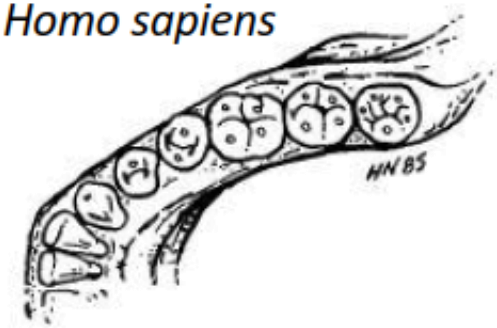


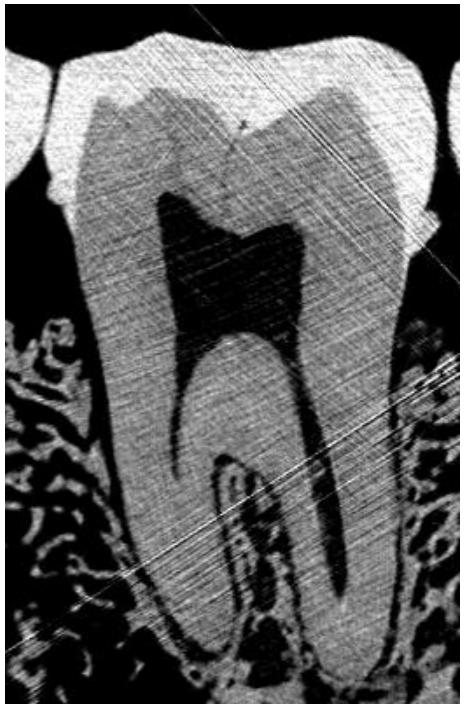
Smaller Premolars and Molars

Néandertaliens

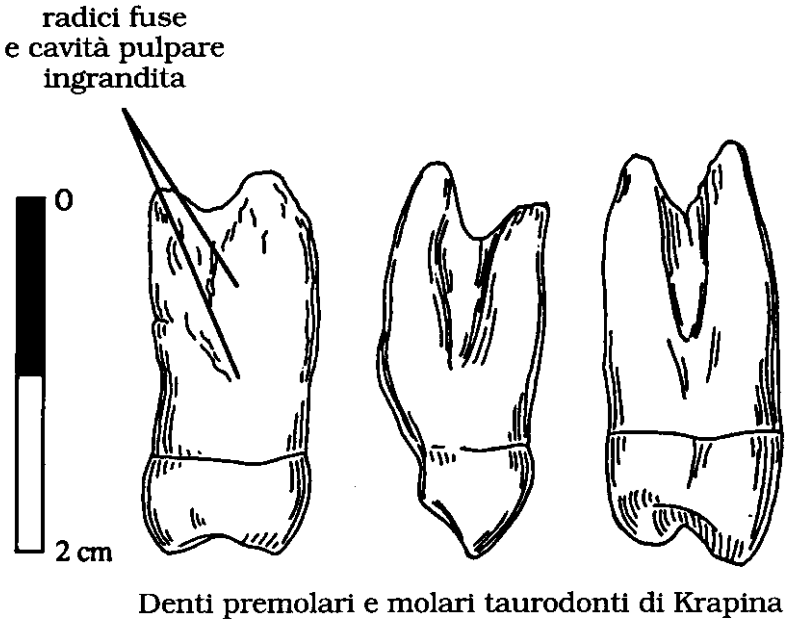


Homo sapiens

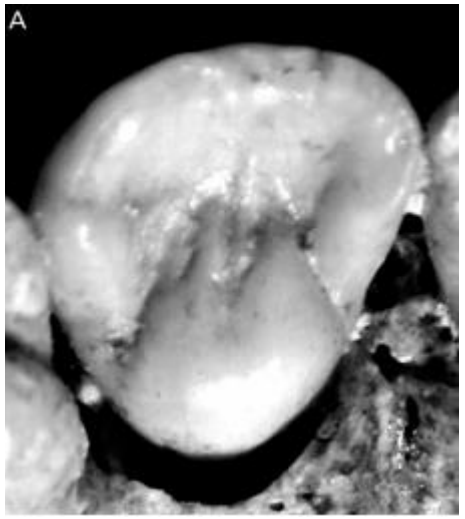




Taurodontismo:
Grande cavità pulpare

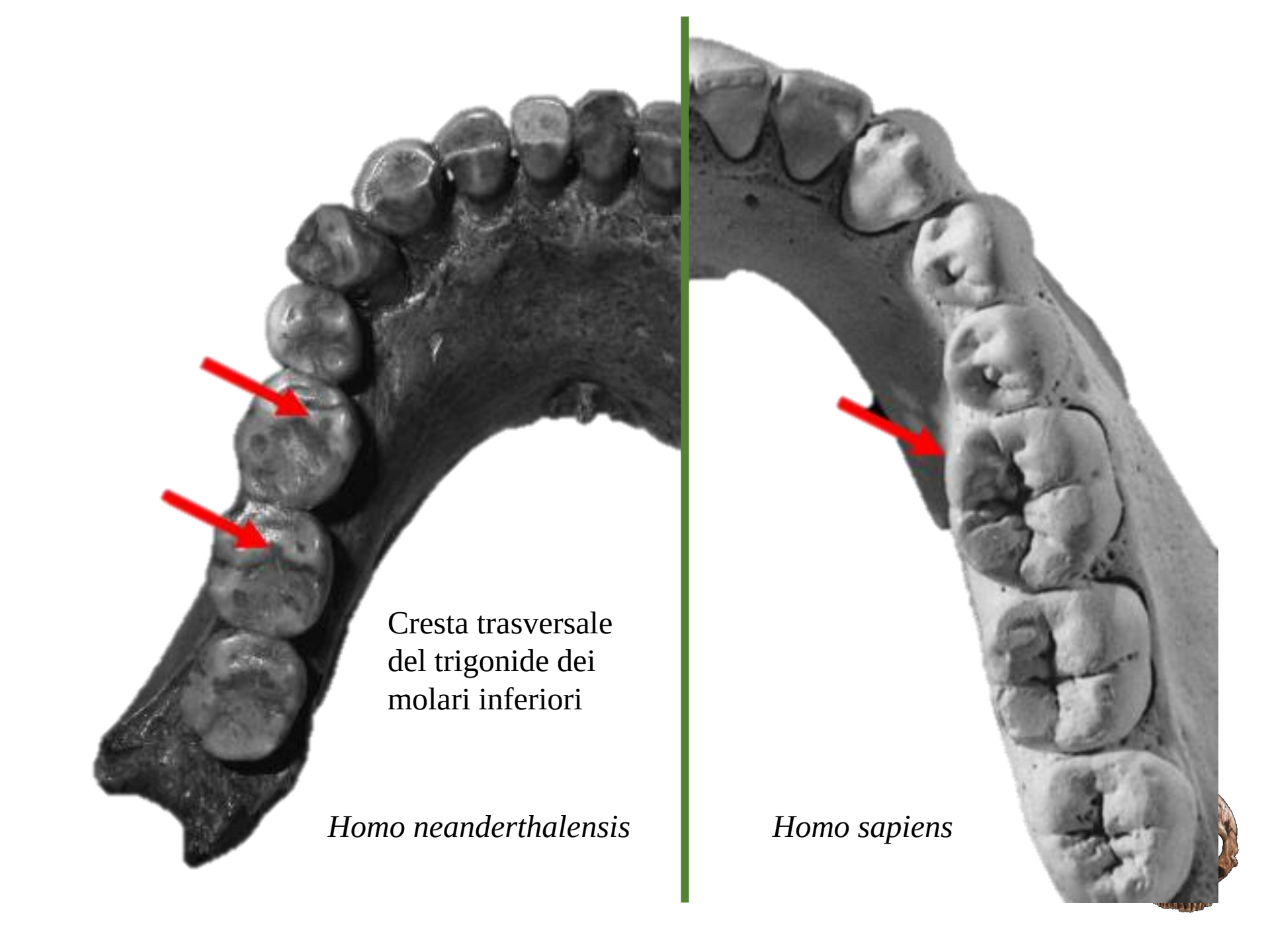


Denti premolari e molari taurodonti di Krapina



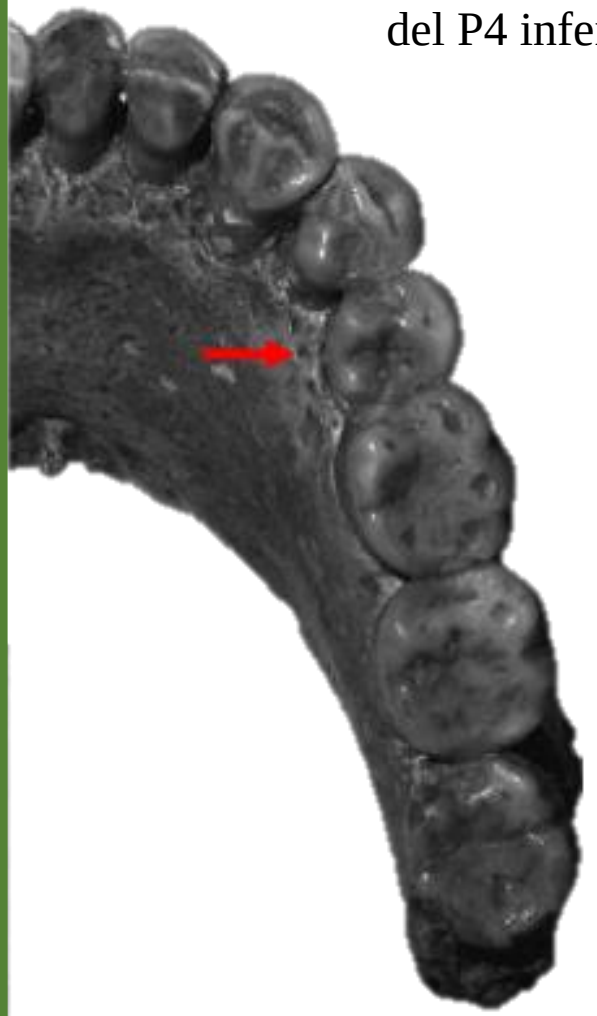
Incisivo con una forma di spatola e con una convessità labiale e un tubercolo linguale

- Dimensione: *Homo* più antico > Neanderthal > *Homo sapiens*
- Incisivi di grandi dimensione
- Incisivi superiori a forma di spatola
- Usura importante dei incisivi
- Spessore ridotto dello smalto
- Taurodontismo


Cresta trasversale
del trigonide dei
molari inferiori
Homo neanderthalensis
Homo sapiens

Asimmetria della superficie linguale del P4 inferiore

Homo sapiens



Homo neanderthalensis

1,65m – 1,55m

Scheletro robusto con inserzioni muscolari robuste.
Robust skeletton with powerful muscular insertion

Vertebre cervicali che denotano un collo corto e tozzo
Cervical vertebra induce a short and squat neck

Muscolatura dorsale molto sviluppata
Dorsal musclulature well developped

Torace largo, sviluppato lateralmente e verso l'avanti
Large thorax, lateraly and frontward developped

Il radio presenta una curvatura che denota una grande capacità di movimento.
The radius is curved which indicate an importante mouvement capacity.

Clavicola grande e gracile
Large and gracile clavicle

Mani grandi ma con dita corte: presa potente ed efficace
Large hand with short finger: powerful and effective handle

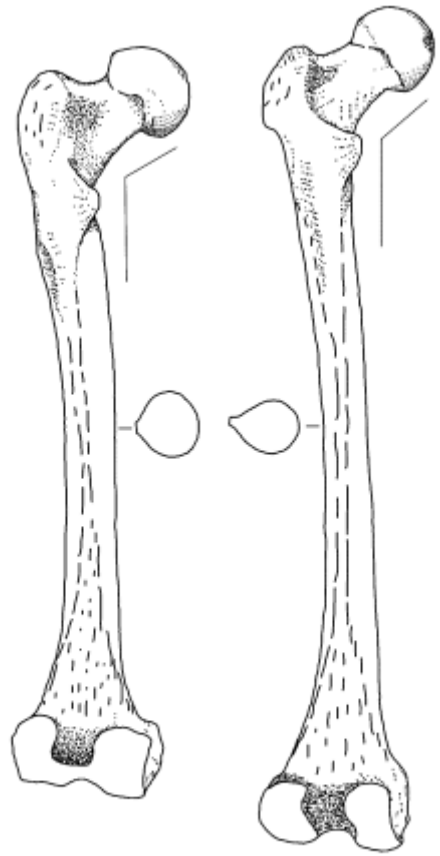
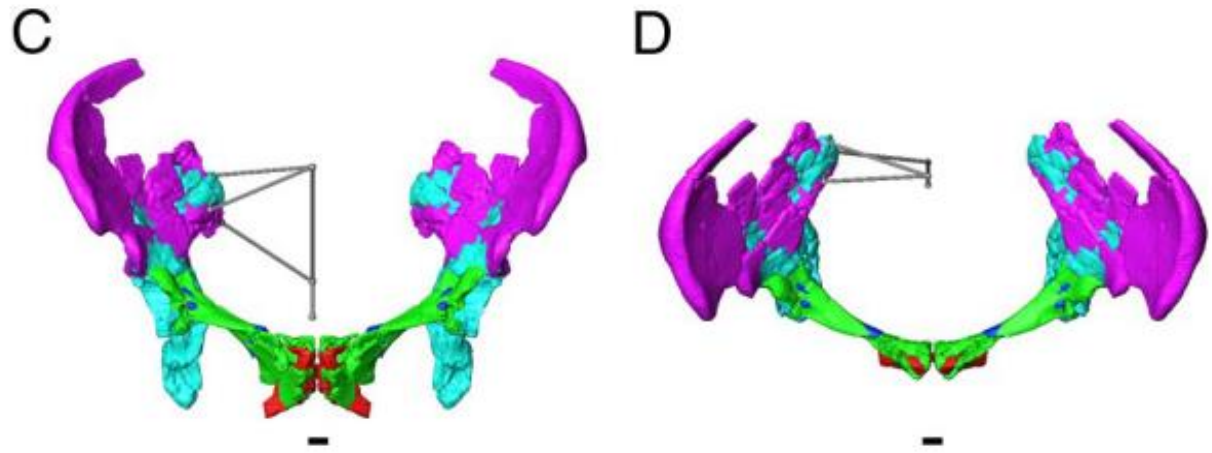


Fig. 1. Distinctive features of the Neandertal femur. (*Left*) The Neandertal 1 (Feldhofer Cave Neandertal) femur. (*Right*) The Skhul IV near-modern human femur. Relative to near-modern humans, the Neandertal femur has larger articulations (head and distal end), a thicker and rounder shaft, and a lower neck-shaft angle. Adapted from McCown and Keith (9).

(Weaver, 2003)

Allungamento mesio-laterale della branca orizzontale dell'osso pubico. Il pube risulta molto alto e gracile.

Extension meso-lateral of the horyzontal crest of the pubic bone. This bone is high and gracile.



Ricostruzione virtuale delle pelvi del neandertal di Tabun (Weaver & Hublin)

Femore corto e curvo. L'epifisi è voluminosa e la diafisi presenta una sezione cilindrica.

L'angolo tra la testa e la diafisi è piccolo.

The femur short and curved. The epiphysis is voluminous and the diaphysis present a cylindrical section.

The angle between the femoral head and the diaphysis is small.

Significato della morfologia

Evoluzione della linea neandertaliana

Il modello di evoluzione dei Neanderthal è detto ad accrezione: questo gruppo di ominidi si é sviluppato in un parziale o completo isolamento dal resto dell'umanità.

Questo sviluppo è il risultato di un accumulazione graduale di tratti morfologici distintivi delle popolazioni Europee.

Alcuni studiosi hanno ipotizzato che i tratti neandertaliani si siano sviluppati seguendo a un adattamento a delle condizioni climatiche fredde :

Larga cavità nasale

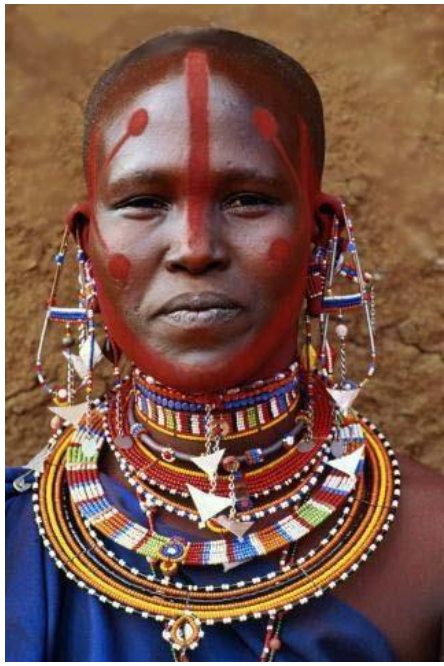
Robustezza

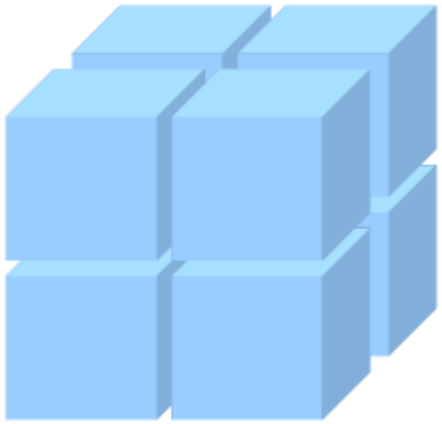
Morfologia tarchiata

Adattamento al freddo

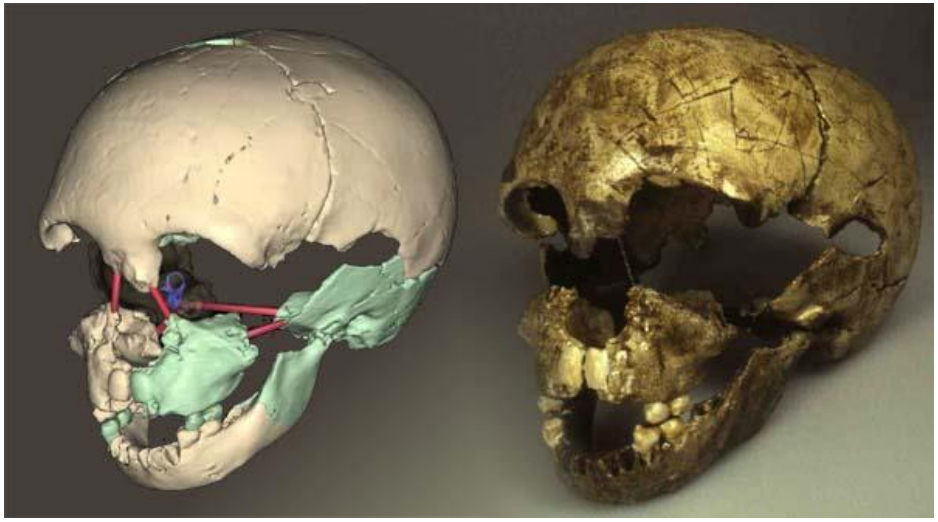
Regola di Allen : In un clima freddo, gli individui tendono ad essere piu larghi e ad avere degli arti più corti rispetto a quelli che vivono in un clima temperato, poiché in questo modo la ritenzione del calore è più efficace (rapporto massa corporea/superficie esposta)

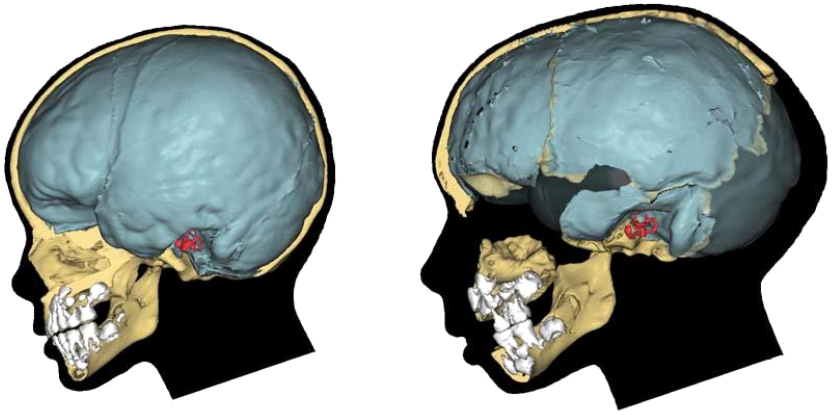
In cold climat, individuals tends to have shorter limbs than the one from warmer climates, in this way the heat rentention is more effective (ratio corporeal mass/exposed surface)





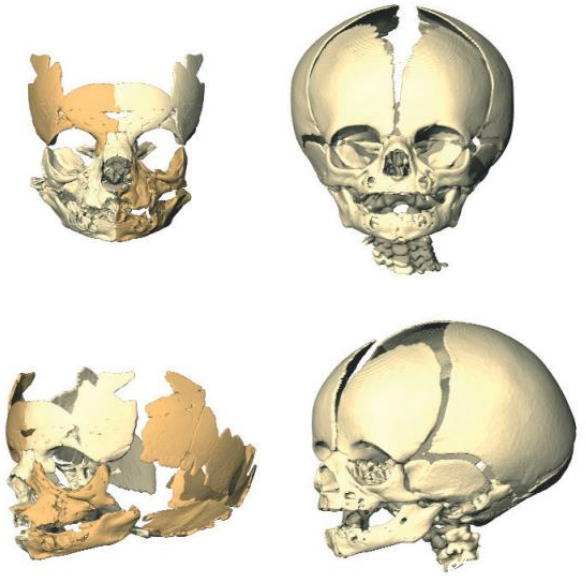
Ontogenesi



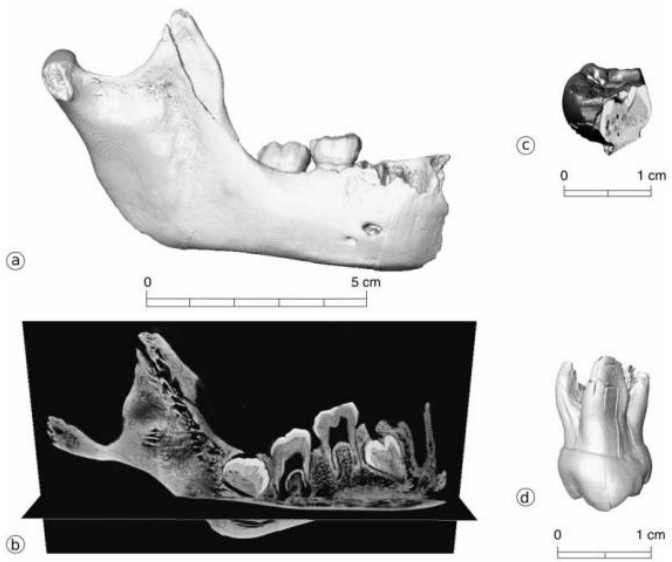


Gibraltar 2, Devil's Tower

Dederiyeh, Syria



Le Moustier 2 is larger and more projected than in the modern human. Orbital, nasal shape and infraorbital surface of Le Moustier 2 are characteristic for Neanderthals



(a and b) Right hemi-mandible from Scladina (Scla 4A-1). (c) Probable Neandertal deciduous molar from Couvin. (d) deciduous second upper molar from Engis 2

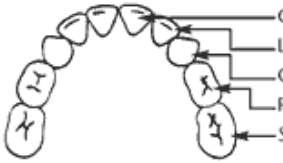
Sequenze d'eruzione dei denti permanenti: differenze tra *sapiens* e *Neanderthal*

Homo sapiens: M1 – I1- I2 – P1 – C-P2-M2-M3

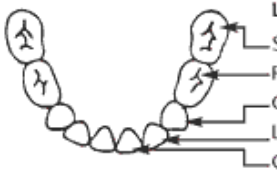
Homo neanderthalensis: M1-I1-I2-C-M2-P1-P2-M3

Eruzione dei denti in *Homo sapiens*

PRIMARY DENTITION

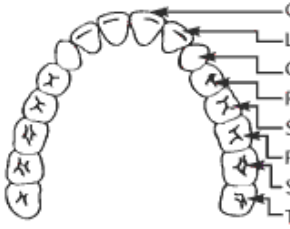


Upper Teeth	Erupt	Exfoliate
Central incisor	8-12 months	6-7 years
Lateral incisor	9-13 months	7-8 years
Canine (cuspid)	16-22 months	10-12 years
First molar	13-19 months	9-11 years
Second molar	25-33 months	10-12 years

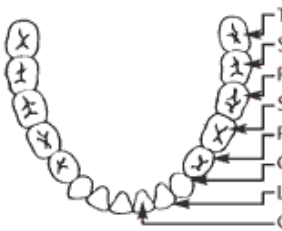


Lower Teeth	Erupt	Exfoliate
Second molar	23-31 months	10-12 years
First molar	14-18 months	9-11 years
Canine (cuspid)	17-23 months	9-12 years
Lateral incisor	10-16 months	7-8 years
Central incisor	6-10 months	6-7 years

PERMANENT DENTITION

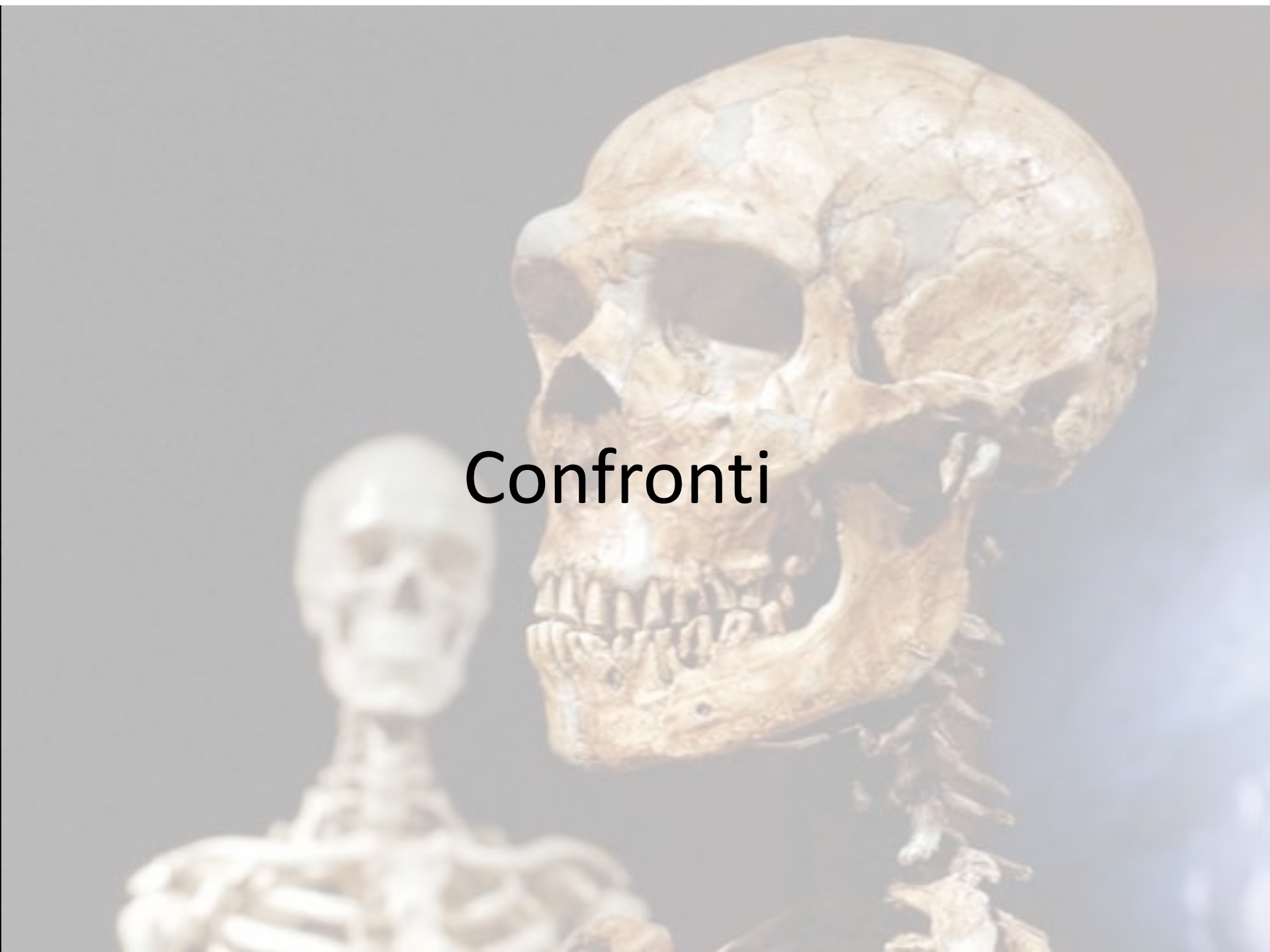


Upper Teeth	Erupt
Central incisor	7-8 years
Lateral incisor	8-9 years
Canine (cuspid)	11-12 years
First premolar (first bicuspid)	10-11 years
Second premolar (second bicuspid)	10-12 years
First molar	6-7 years
Second molar	12-13 years
Third molar (wisdom tooth)	17-21 years



Lower Teeth	Erupt
Third molar (wisdom tooth)	17-21 years
Second molar	12-13 years
First molar	6-7 years
Second premolar (second bicuspid)	10-12 years
First premolar (first bicuspid)	10-11 years
Canine (cuspid)	11-12 years
Lateral incisor	8-9 years
Central incisor	7-8 years

Source: Adapted with permission from the Arizona Department of Health Services, Office of Oral Health, courtesy of Don Altman, D.D.S., M.P.H. The assistance of the American Dental Hygienists' Association is gratefully acknowledged.



Confronti

Definizione dei Neandertaliani s.s.

L'uomo di Neanderthal si caratterizza per la presenza di:

The Neandertals are caracterized by the presence of:

- **Caratteri arcaici / Plesiomorfie** : dei caratteri ancestrali che non si ritrovano in nessun fossile moderno.

  Arcaic features / Plesiomorphies: These are ancestral features which are not found in the modern fossil.

- **Caratteri condivisi** con *Homo sapiens.*

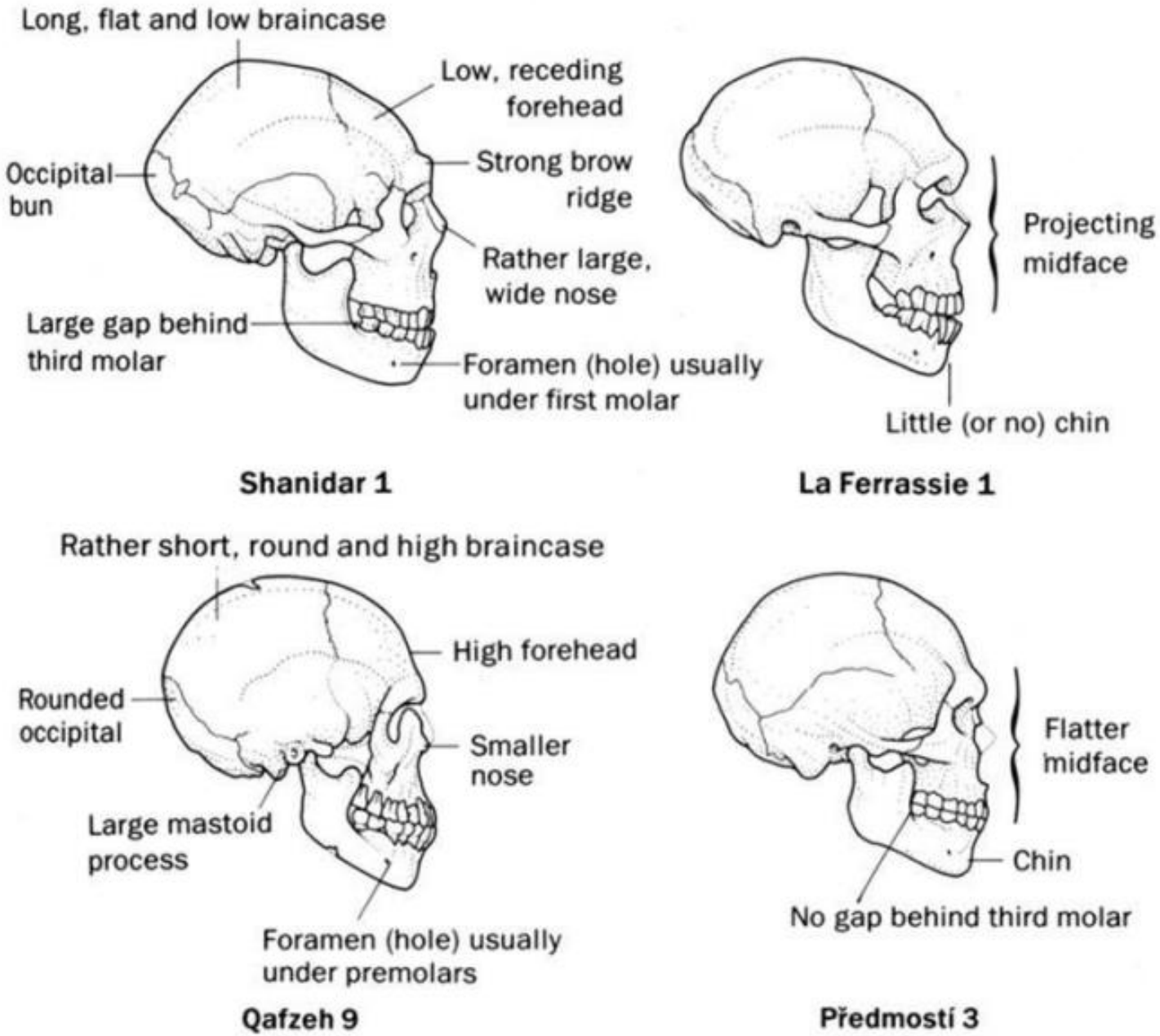
  Feature shared with Homo sapiens

- **Caratteri derivati / Apomorfie** : presenti solo nei Neandertaliani, peculiari ed identificativi di questa specie.

  Derivated features / Apomorphies: These are present only in the Neanderthals, and allow to identify this species.

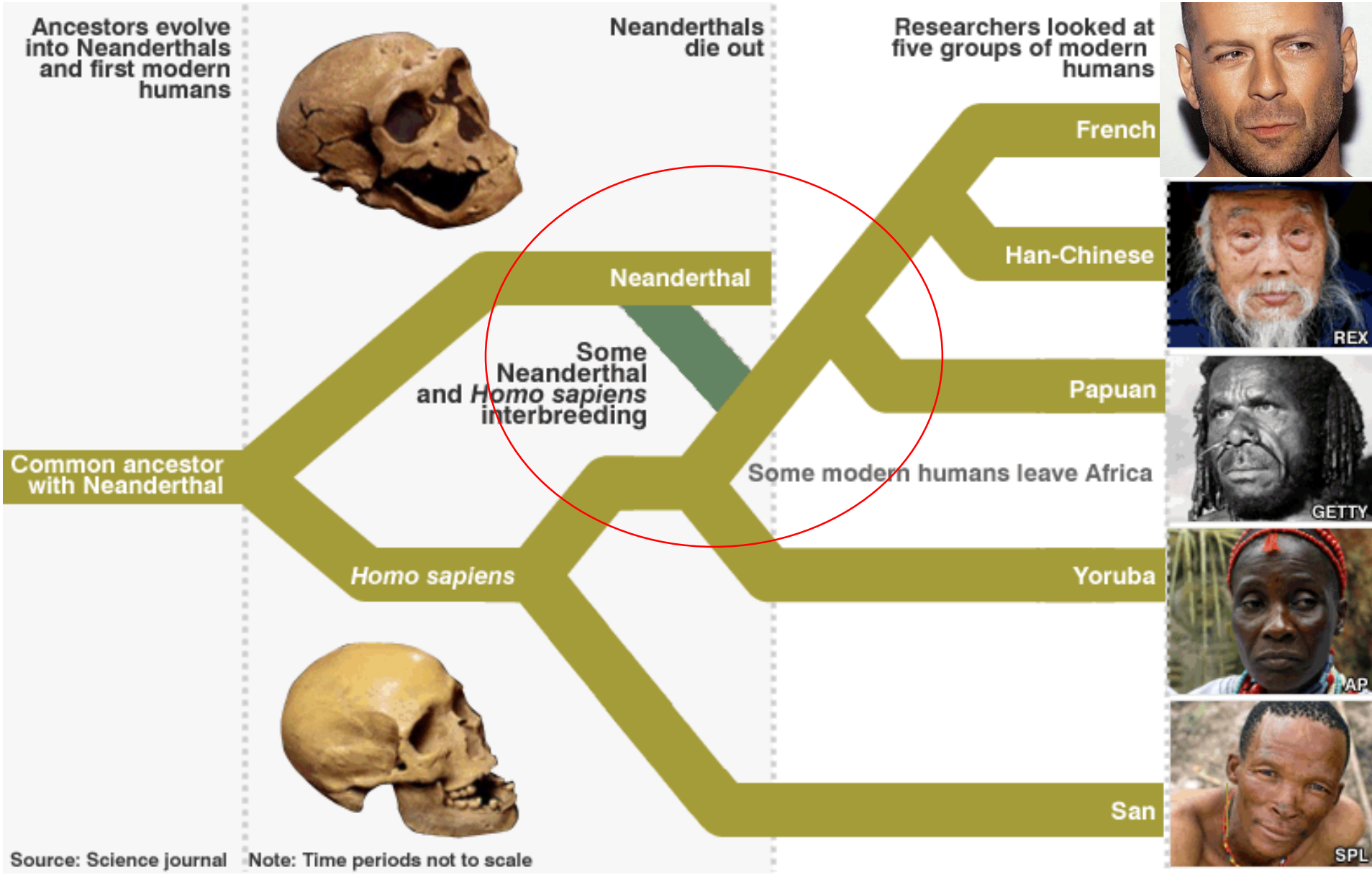
Homo neanderthalensis VS *Homo erectus*

Homo neanderthalensis VS *Homo sapiens*



Genetica

Uno di noi?


Ancestors evolve into Neanderthals and first modern humans
Neanderthals die out
Researchers looked at five groups of modern humans
French
Han-Chinese
Papuan
Neanderthal
Some Neanderthal and Homo sapiens interbreeding
Common ancestor with Neanderthal
Some modern humans leave Africa
Homo sapiens
Yoruba
San
REX
GETTY
AP
SPL
Source: Science journal
Note: Time periods not to scale

Green et al. (2010)

- Quando le popolazioni ancestrali Neandertaliane e umane moderne hanno subito una divergenza evolutiva? *Divergence time between the ancestral Neandertal population and the modern human :*

  tra 270,000 e 440,000 anni fa

- Da 1 a 4 % del genoma della popolazione Euroasiatica è derivato dai Neandertaliani. Il flusso genetico tra uomini moderni e Neandertaliani è avvenuto prima della divergenza tra gli europei , gli asiatici, e i papuani, tra 50,000 e 80,000 anni fa, in concordanza con i ritrovamenti archeologici.

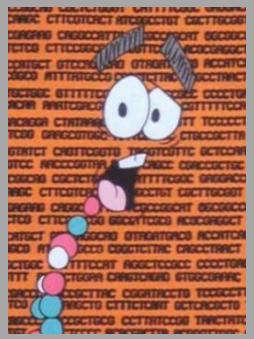
  From 1 to 4 % of the Eurasiatic population's genoma derives from the Neandertal. The genetic flow between modern human and Neandertal occurred before the divergence between European, Asiatic and Papuan populations, between 50,000 and 80,000 years, in correspondence with the archeological discoveries.

- L'incontro è stato puntuale da un punto di visto cronologico e localizzato solo nel Vicino Oriente.

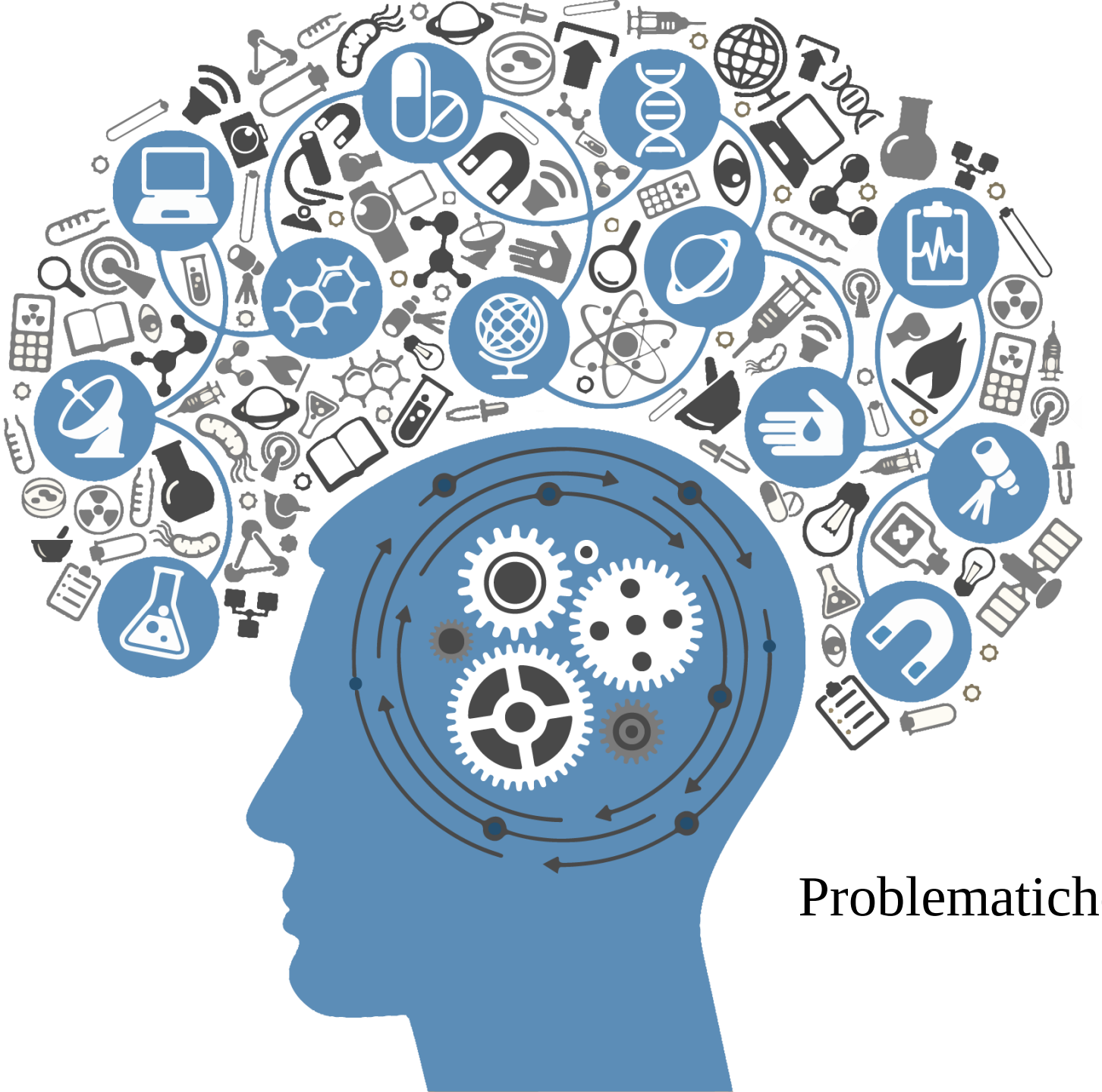
  The encounter was punctual in a chronological point of view and localized only in a the Nearest.

L’incontro in Europa

Peștera cu Oase, Romania
40 000 anni BP



(Fu et al., 2015)

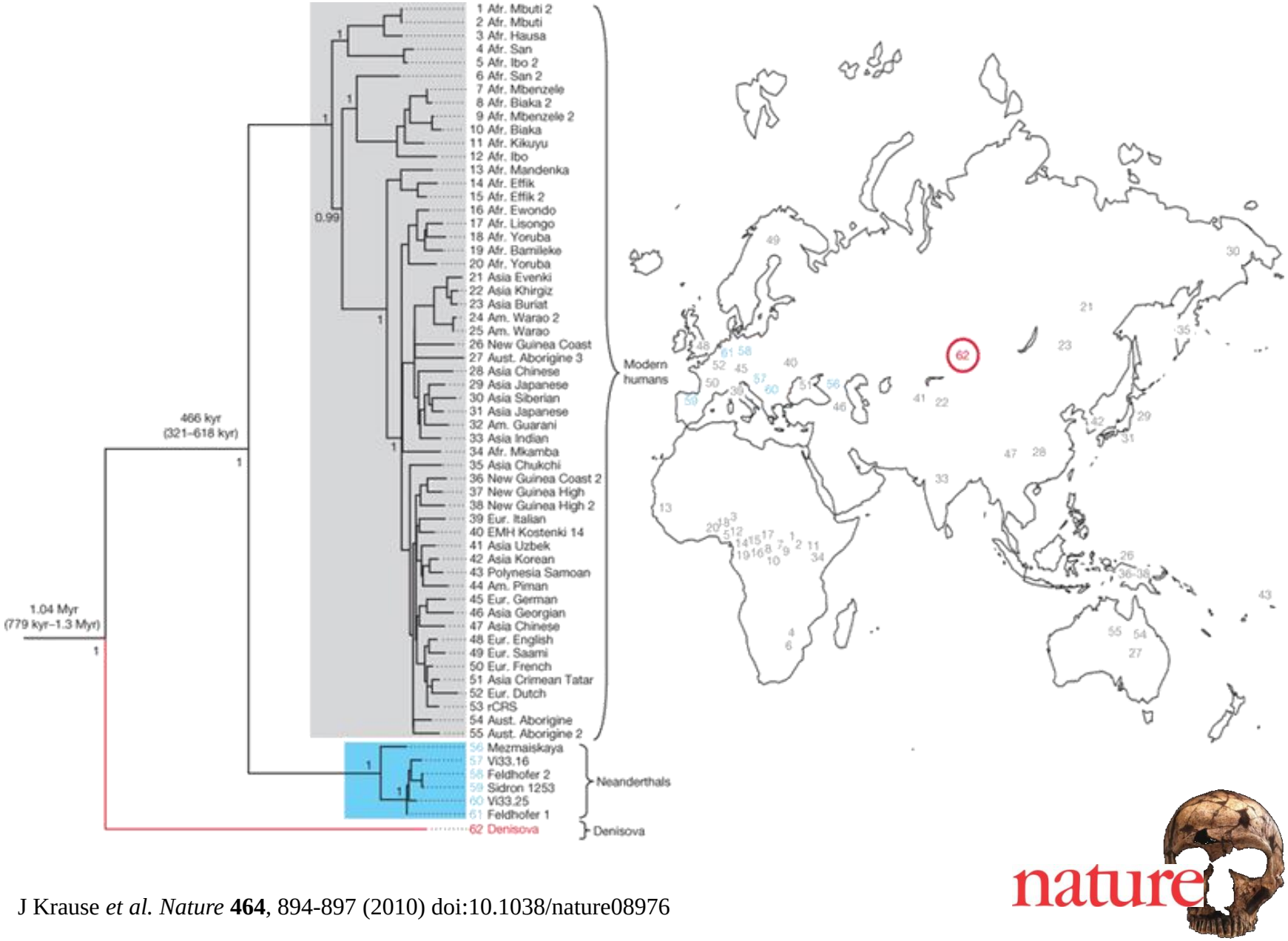


Problematiche

Denisova

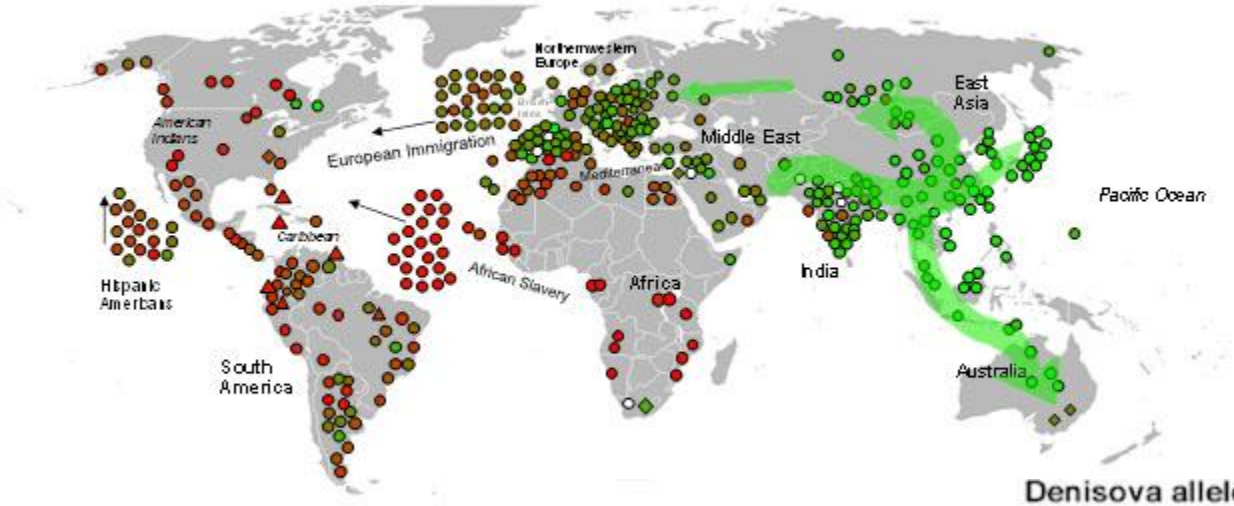
Replica of the finger bone fragment from the ancient Denisovan human who lived about 30-50 000 years ago. Scientists have obtained its complete genome. © Max Planck Institute for Evolutionary Anthropology

Phylogenetic tree of complete mtDNAs.

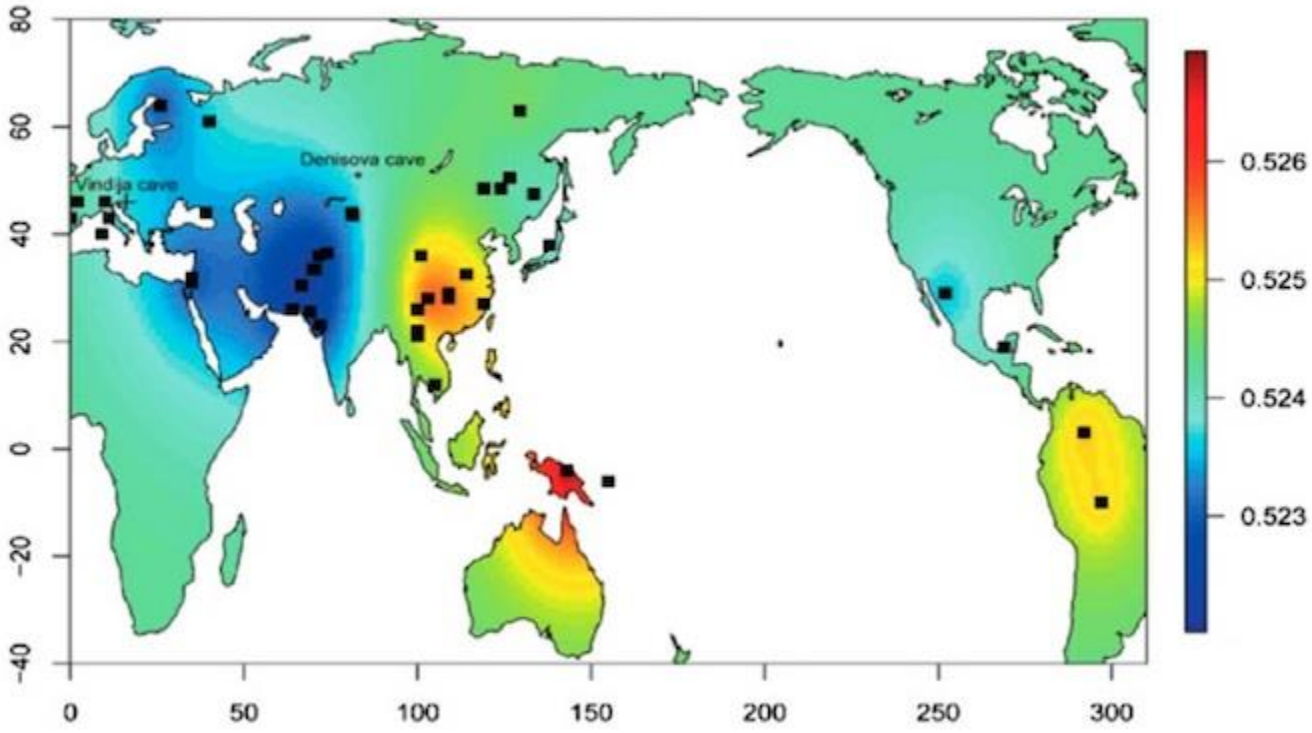


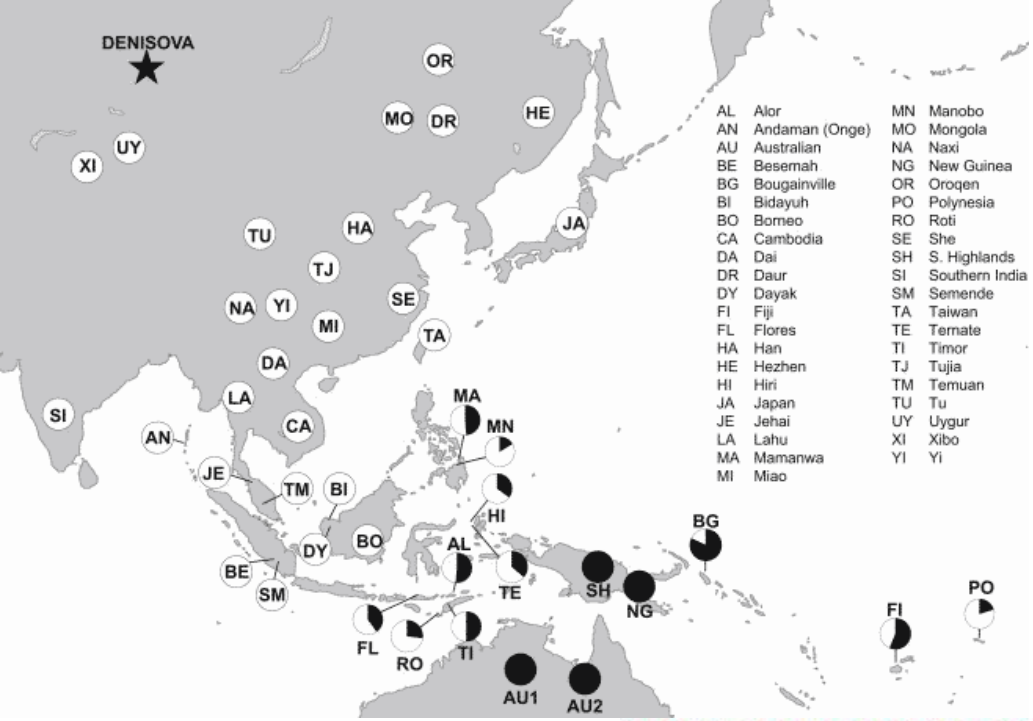
J Krause *et al. Nature* **464**, 894-897 (2010) doi:10.1038/nature08976

World Ancestry of the Denisovan Gene

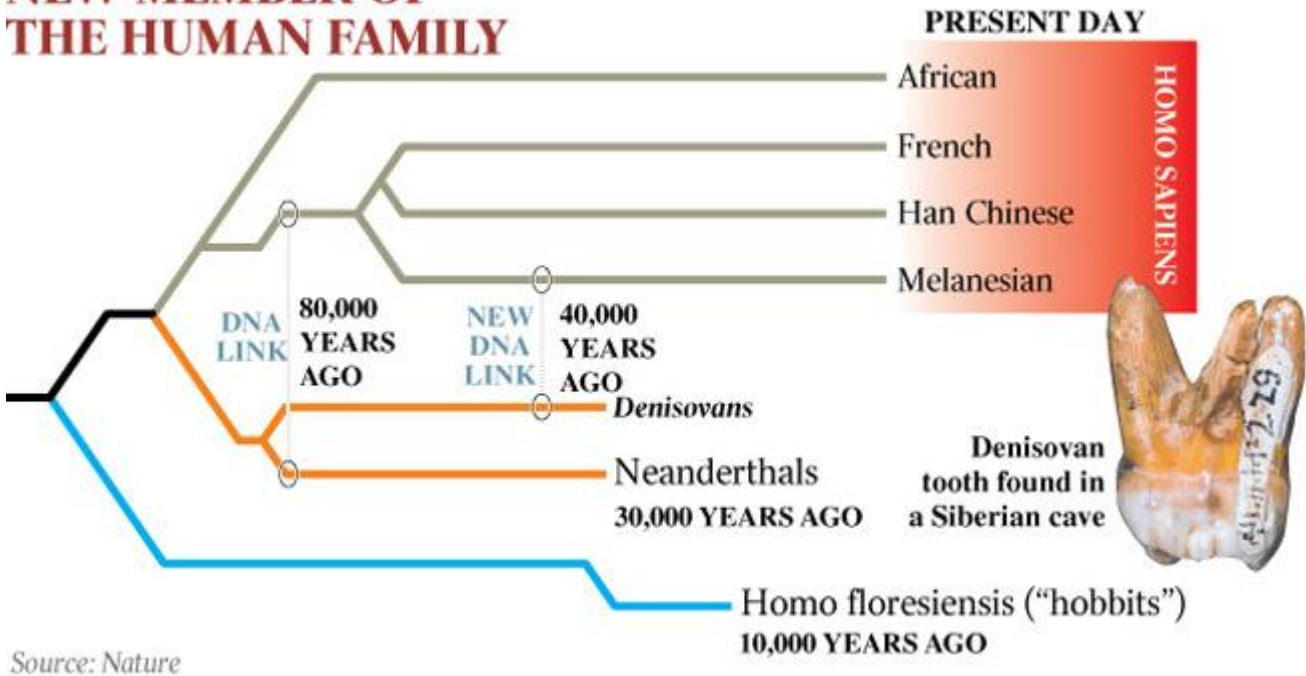


Denisova allele frequency



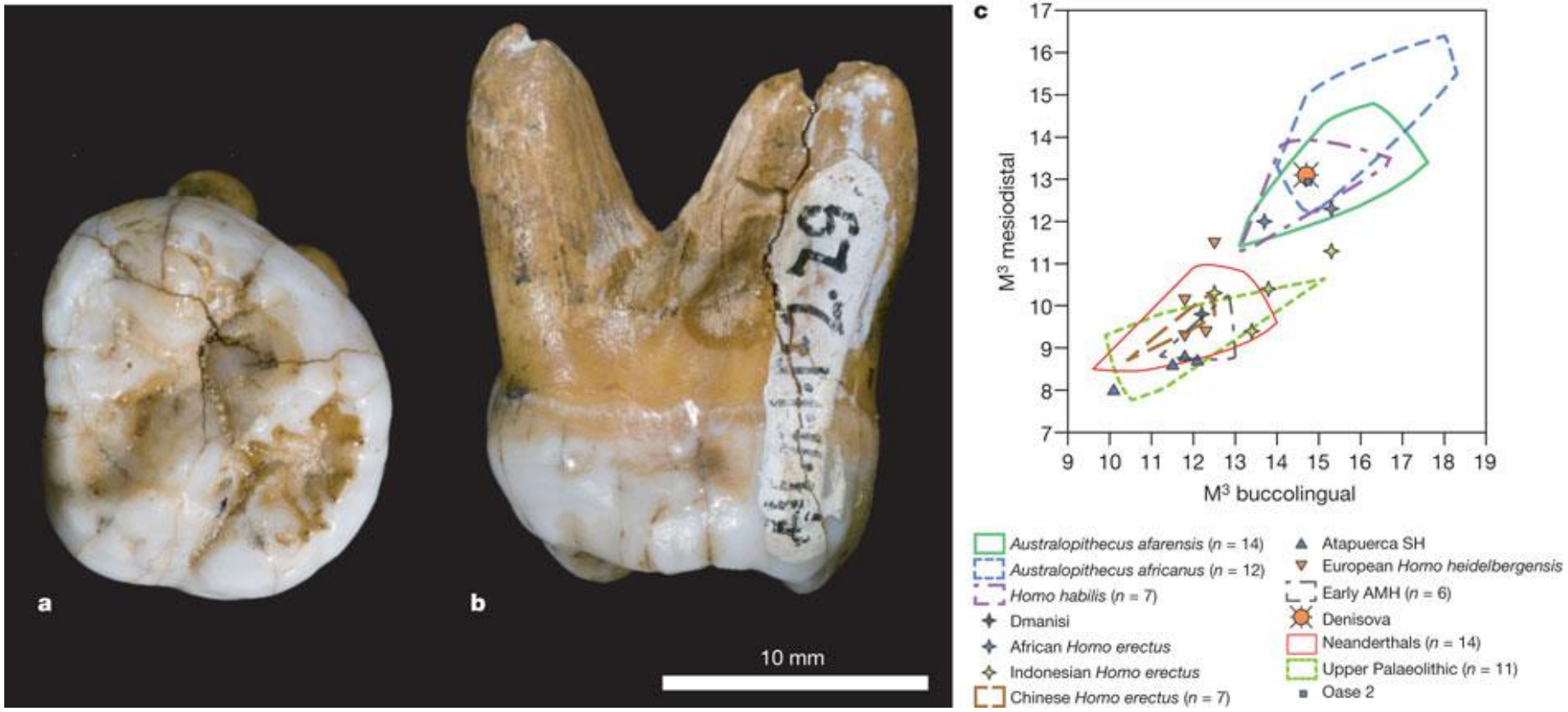


NEW MEMBER OF THE HUMAN FAMILY



Source: Nature

Morphology of the Denisova molar.



D Reich *et al. Nature* **468**, 1053-1060 (2010) doi:10.1038/nature09710

Il M3 o M2 ritrovato a Denisova presenta delle dimensione al di fuori della variabilità dei taxa del genere *Homo* ed entra in quella dei Autralopitecine.

Questo molare appoggia le evidenze del DNA: La popolazione di Denisova era distinta dei Neandertaliani tardivi e dei uomini moderni. In effetti, i tratti primitive del dente suggeriscono che i Denisoviani potrebbero essersi separati della linea neandertaliana prima dei dati che abbiamo sui tratti dentari Neandertaliani in Europa occidentale (>300 ka). Non escludiamo pero la possibilità che questa morfologia sia dovuta ad una regressione.

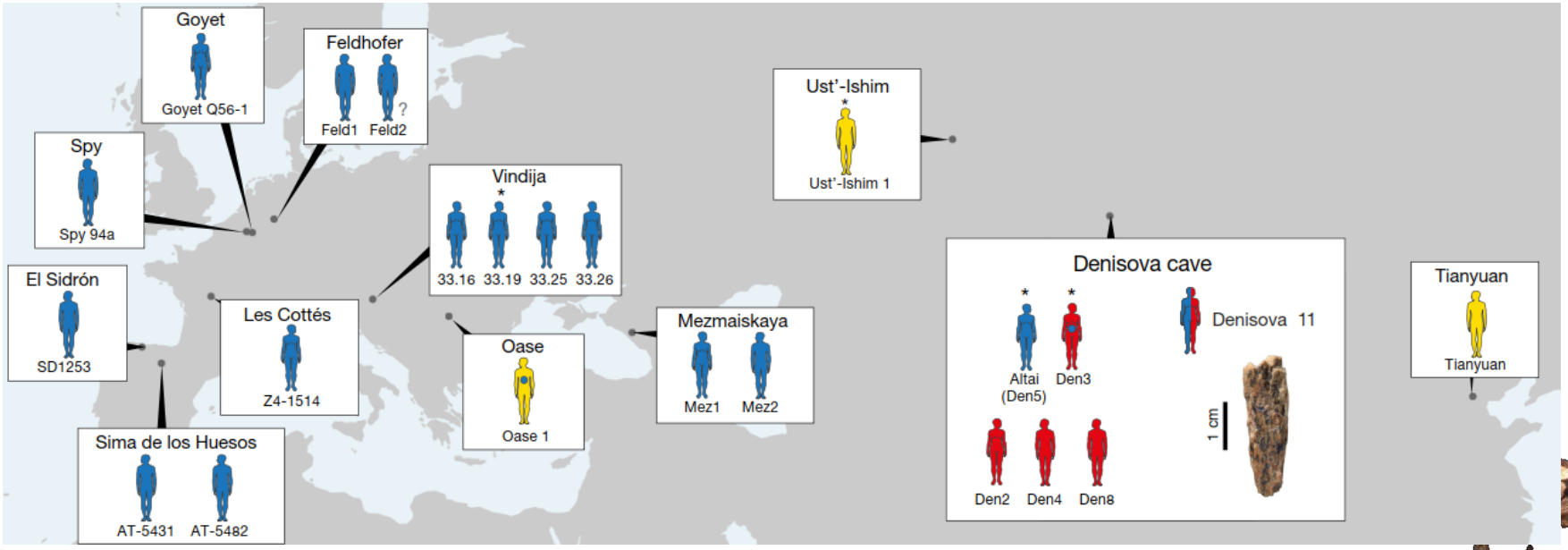
LETTER

https://doi.org/10.1038/s41586-018-0455-x

The genome of the offspring of a Neanderthal mother and a Denisovan father

Viviane Slon[1,7]*, Fabrizio Mafessoni[1,7], Benjamin Vernot[1,7], Cesare de Filippo[1], Steffi Grote[1], Bence Viola[2,3], Mateja Hajdinjak[1], Stéphane Peyrégne[1], Sarah Nagel[1], Samantha Brown[4], Katerina Douka[4,5], Tom Higham[5], Maxim B. Kozlikin[3], Michael V. Shunkov[3,6], Anatoly P. Derevianko[3], Janet Kelso[1], Matthias Meyer[1], Kay Prüfer[1] & Svante Pääbo[1]*

Neanderthals and Denisovans are extinct groups of hominins that separated from each other more than 390,000 years ago[1,2]. Here we present the genome of 'Denisova 11', a bone fragment from Denisova Cave (Russia)[3] and show that it comes from an individual who had a Neanderthal mother and a Denisovan father. The father, whose genome bears traces of Neanderthal ancestry, came from a population related to a later Denisovan found in the cave[4–6]. The mother came from a population more closely related to Neanderthals who lived later in Europe[2,7] than to an earlier Neanderthal found in Denisova Cave[8], suggesting that migrations of Neanderthals between eastern and western Eurasia occurred sometime after 120,000 years ago. The finding of a first-generation Neanderthal–Denisovan offspring among the small number of archaic specimens sequenced to date suggests that mixing between Late Pleistocene hominin groups was common when they met.



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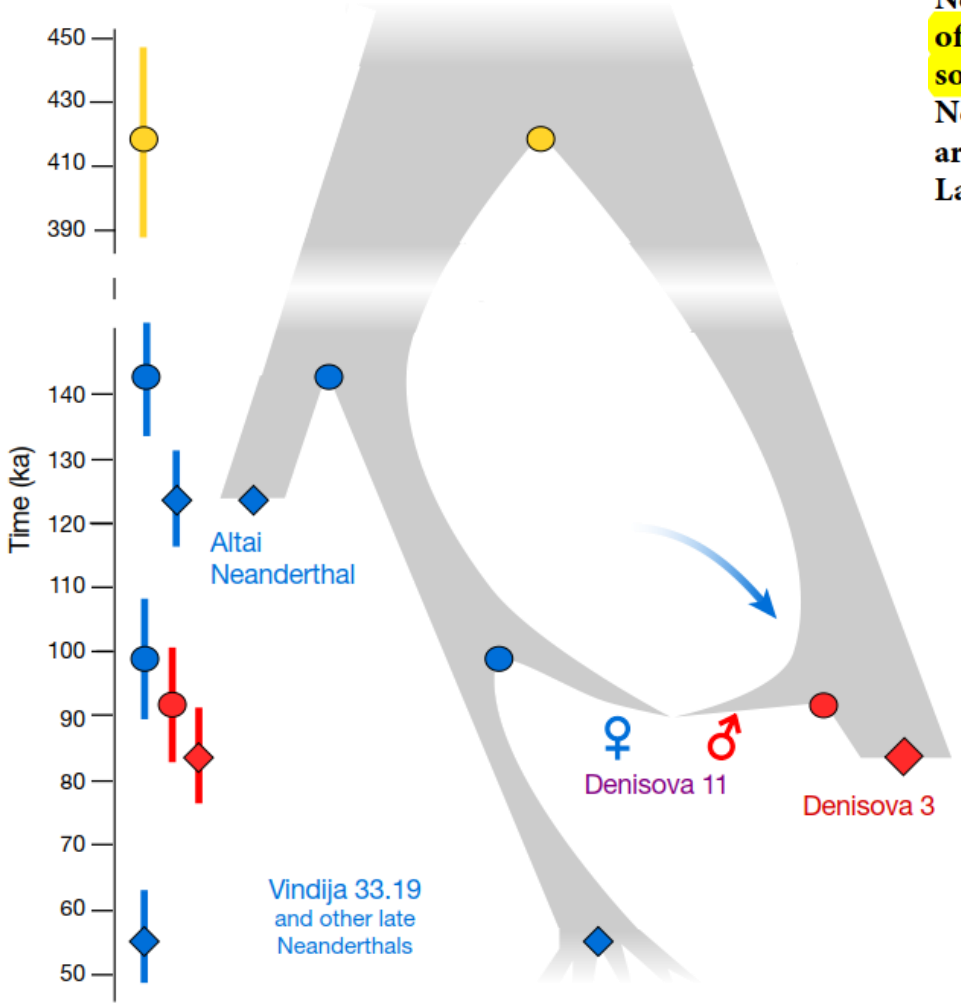
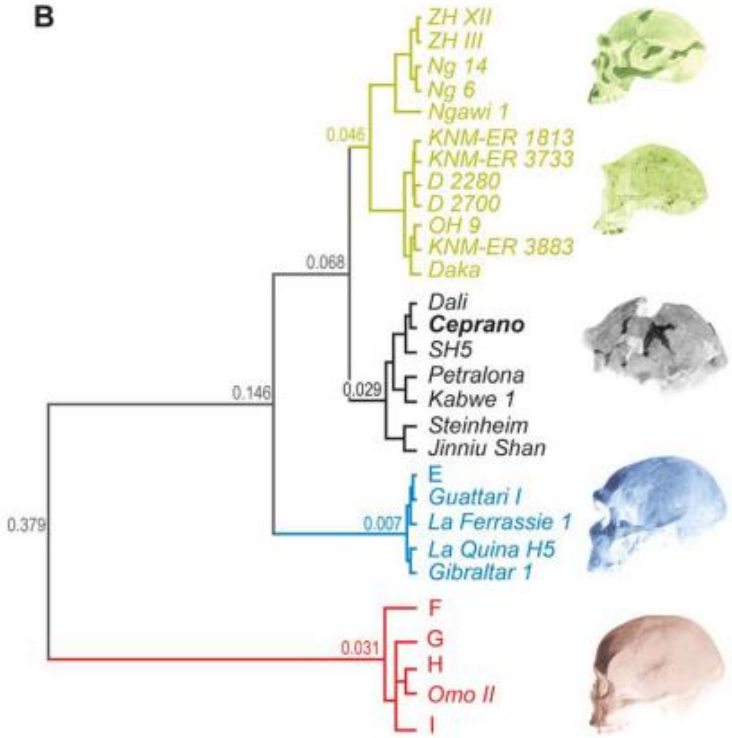
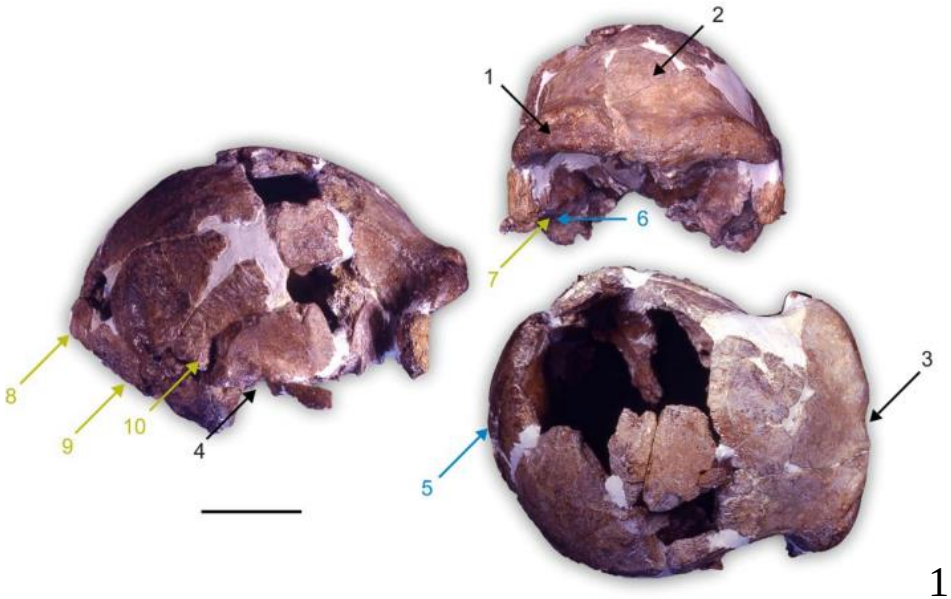


Ceprano : 430 - 385 ka

(Mounier, 2012)





1 a 4

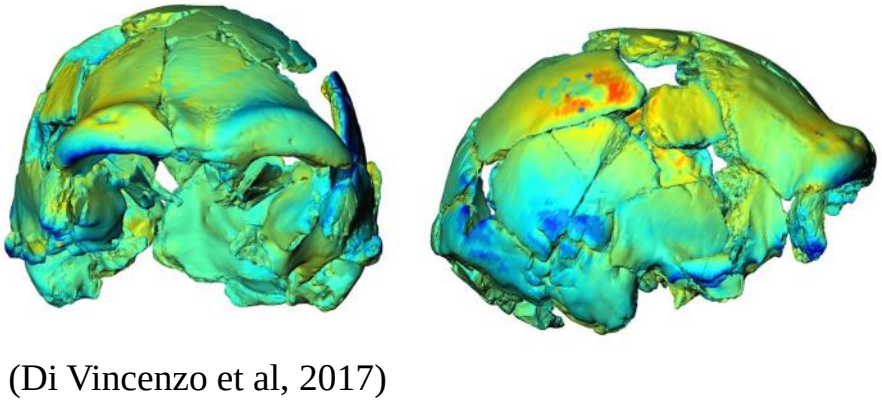
Tratti esclusivamente trovati nei specimen del P. medio

5 & 6

Tratti derivati

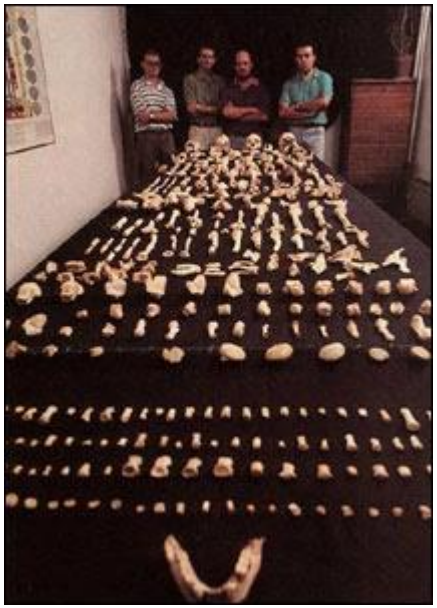
7 a 10

Tratti primitivi



(Di Vincenzo et al, 2017)

Sima de los Huesos: 430 ka



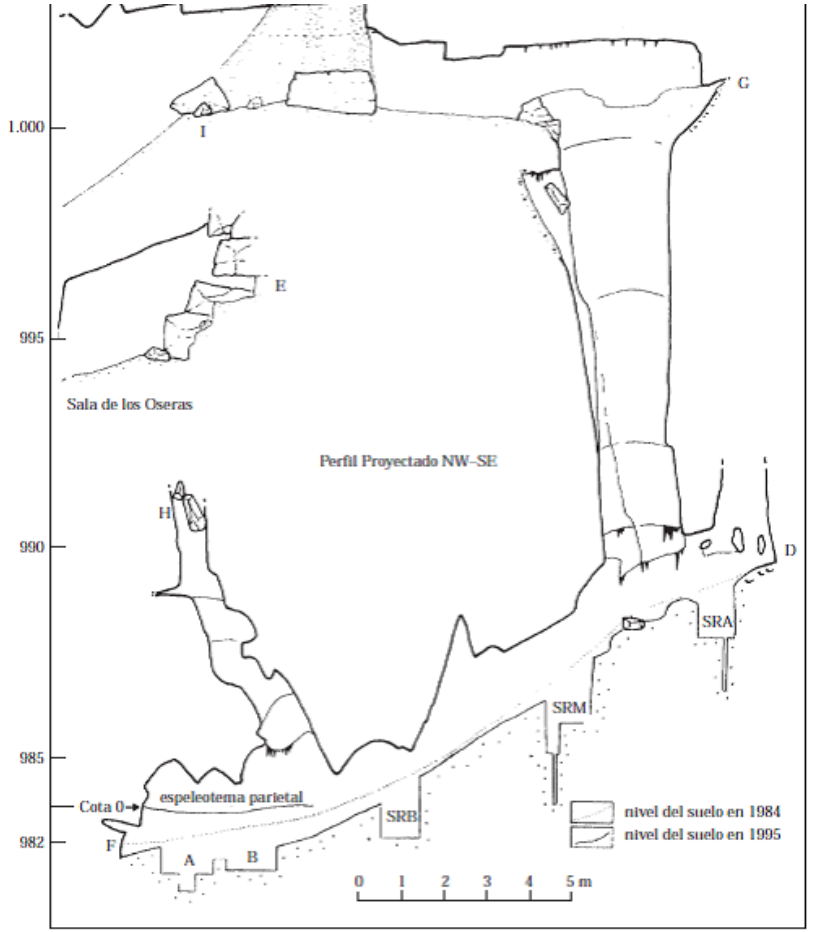


Figure 9. Sima de los Huesos profile (by G. E. Edelweiss, 1992–1996). Projection as in Figure 5. "Tapón de margas" indicates a cone of Neogene white marls coming from the outside. The levels of 1984 and 1995 floors are indicated, as well as a wall speleothem. The blind chimney in Sima de los Huesos behind (to the right of) the shaft, has not been completely drawn.

Sima de los Huesos: 430 ka

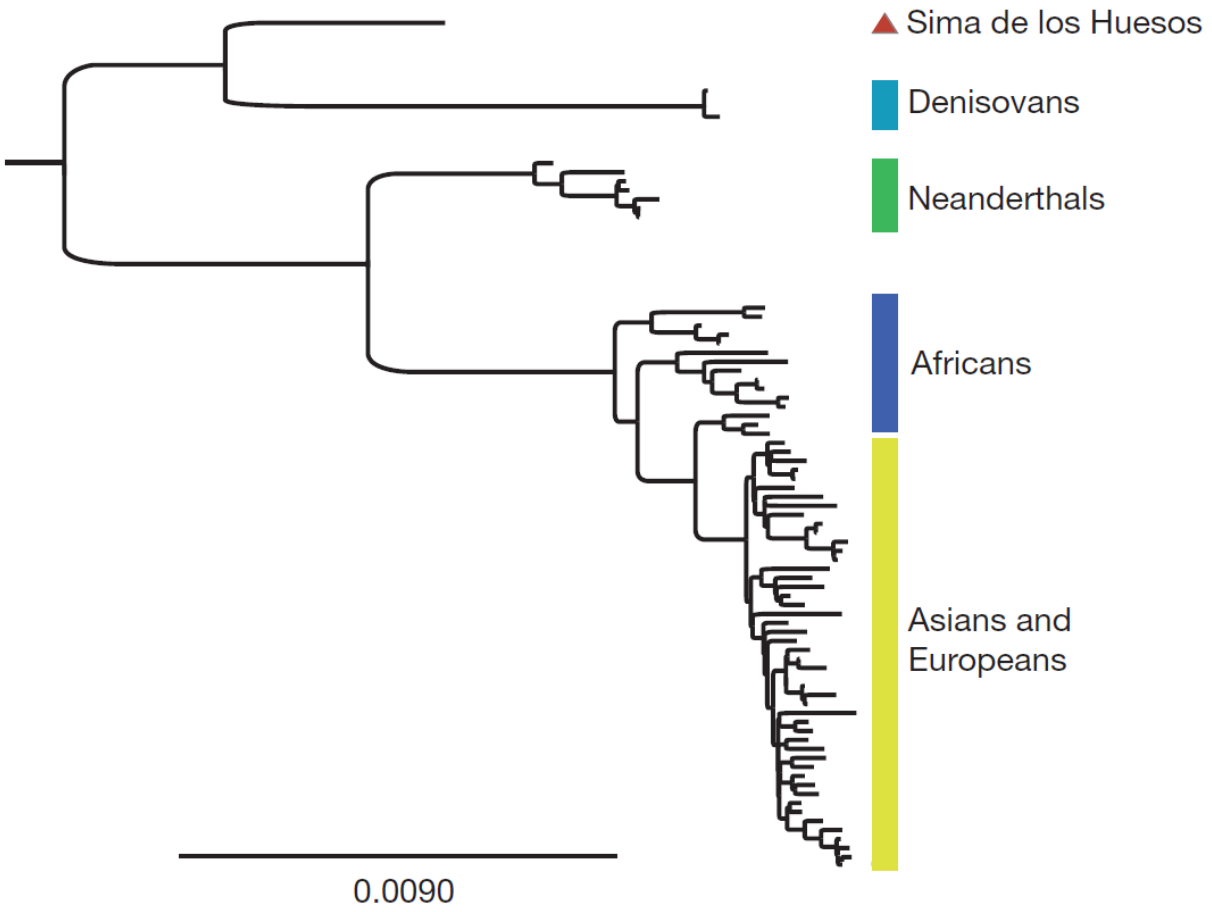


Figure 4 | Bayesian phylogenetic tree of hominin mitochondrial relationships based on the Sima de los Huesos mtDNA sequence determined using the inclusive filtering criteria. All nodes connecting the denoted hominin groups are supported with posterior probability of 1. The tree was rooted using chimpanzee and bonobo mtDNA genomes. The scale bar denotes substitutions per site.

Matthias Meyer et al. in Nature (2013)

Esempi di siti attribuiti a Neanderthal

La scoperta

Il primo fossile considerato come Neanderthal è stato scoperto nel 1856 nella valle di Neander, nella grotta di Feldhofer.

The first fossil considered as a Neanderthal was discovered in 1856 in the Neander Valle, in Feldhofer cave.

Al momento della scoperta gli operai trovarono sul suolo un cranio robusto, delle ossa lunghe, delle coste, un frammento di bacino e di scapola. Queste ossa, considerate dagli operai come i resti ossei di un orso delle caverne, furono portate a J.C. Fuhlrott, il maestro della regione appassionato naturalista. Fin dall'inizio Fuhlrott considerò queste ossa come quelle di un « nuovo » uomo.

When the site was discovered, the workers found a robust skull and some bones. First these bones was considered as bears bones. Later, J.C.Fuhlrott did some study and found that they were bones from a « new » Homo.

La scoperta

H. neandertalensis
(Spy, Belgio)

Questo fossile non fu il primo Neandertaliano portato alla luce. Altri due fossili erano già stati trovati : uno a Engis in Belgio in 1929 e uno in Spagna a Gibraltar in 1848. Ma il fossile scoperto nella valle di Neander ha confermato l'esistenza di un Uomo fossile.

This fossil weren't the first Neanderthal highlight. Two other fossil were already found: One in Engis (Belgium) in 1929 and one at Gibraltar (Spain) in 1848. But with the discovery of the Neander Valle, the existance of a human fossil was confirmed.

Altre scoperte di altri fossili in Belgio a la Naulette e a Spy nel 1966 e 1886 confermarono la presenza dei Neandertaliani in Europa.

Other discoveries in Belgium at La Naulette e a Spy in 1966 e 1886 has confirmed the presence of Neanderthal in Europa.

Mandibola
H. neandertalensis
(La naulette, Belgio)

Biache-Saint-Vaast (Francia) 250 ka BP

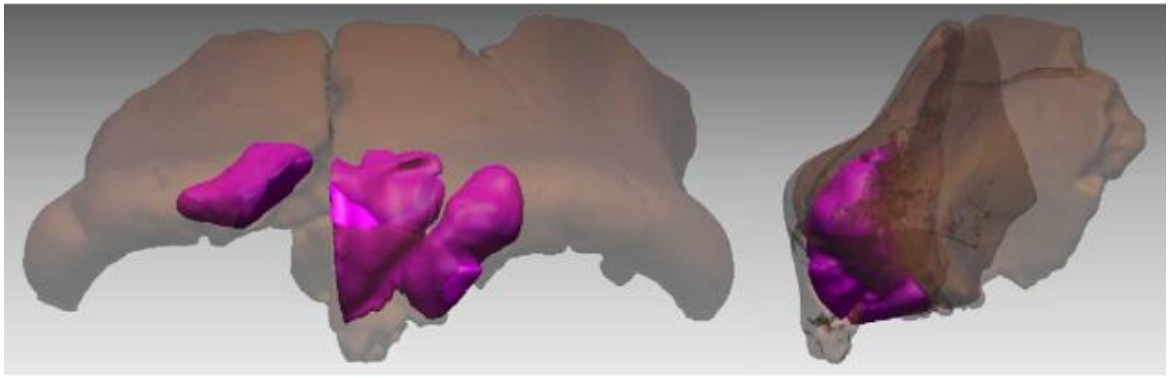


Fig. 4. Frontal sinuses of Biache-Saint-Vaast 2 after virtual reconstruction.

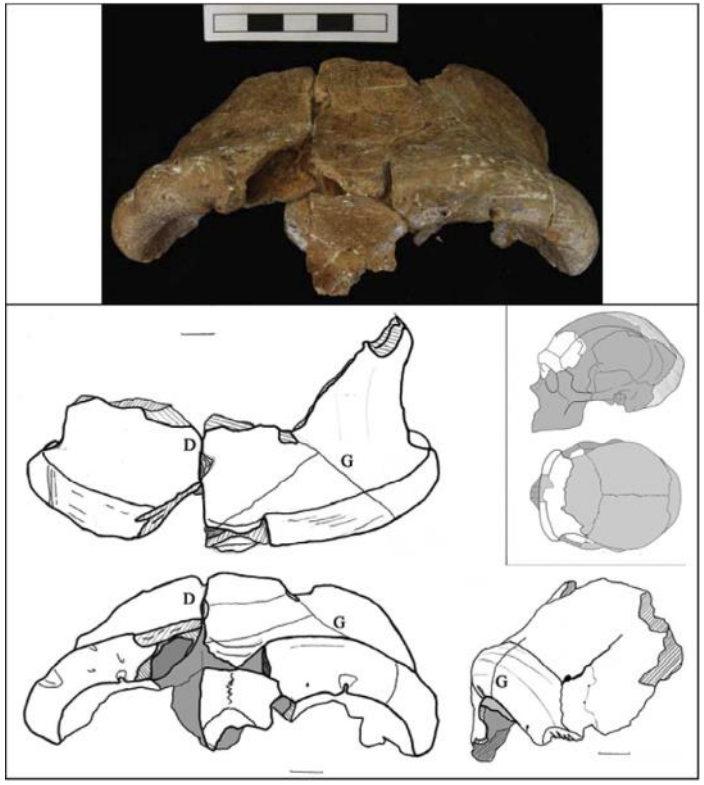
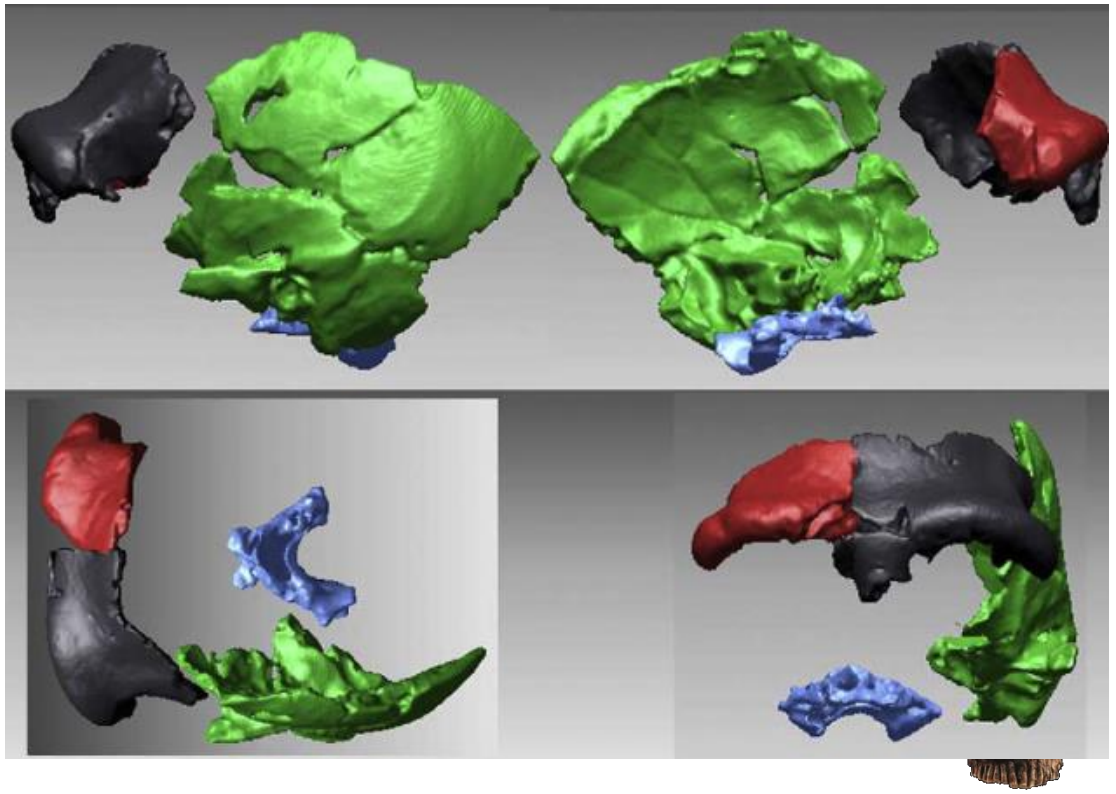


Fig. 1. Frontal bone of the Biache-Saint-Vaast 2 skull. Scale bar is 1 cm.

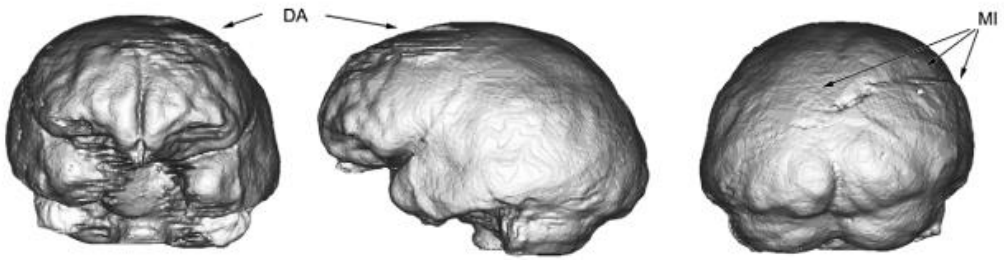


(Guipert et al. 2011)

Italia : Saccopastore 250 ka BP

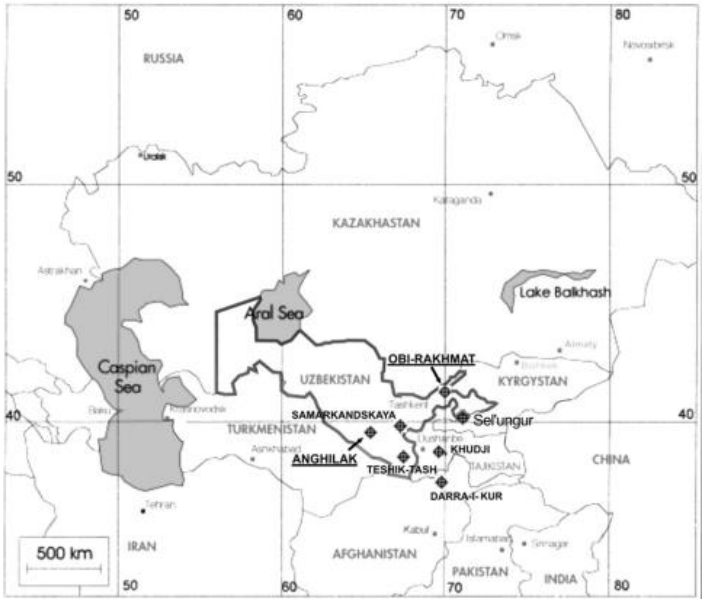
Saccopastore 1 e 2

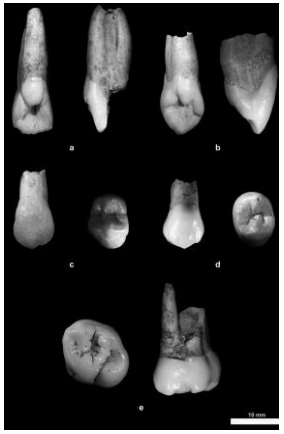
Saccopastore 1



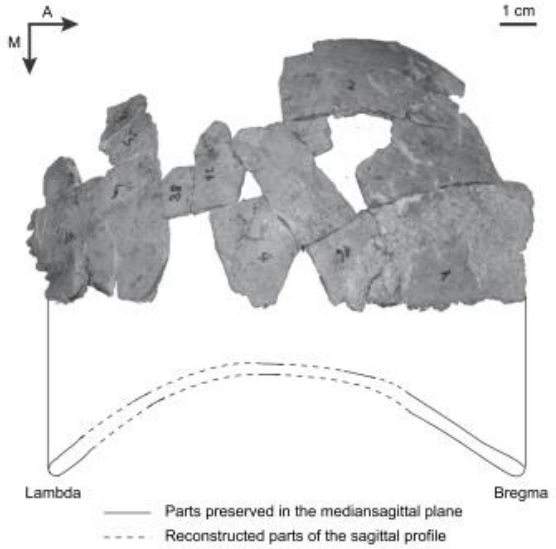
Replica digitale dell’endocranio di SCP1

Uzbekistan: Grotta Obi-Rakhmat 60-90 ka BP

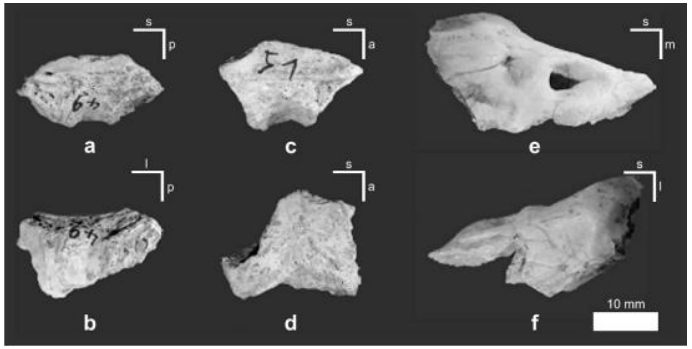




OR 1 : Denti permanenti superiori sinistri



Ricostruzione del parietale di OR 1.



Frammenti di temporale

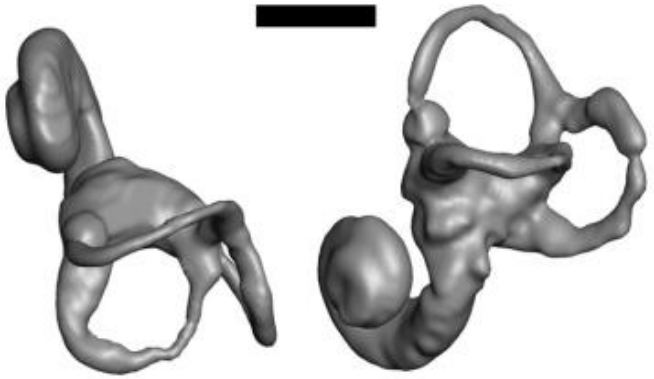
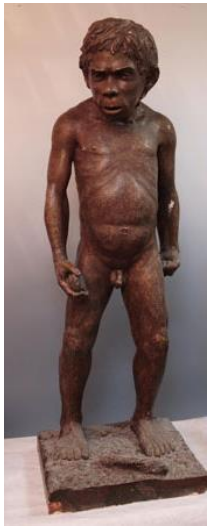
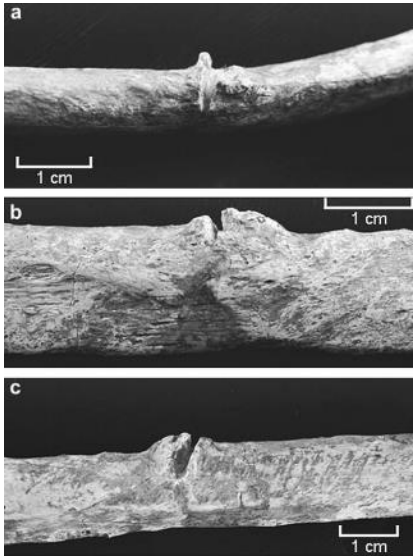


Fig. 9. Left semicircular canal of OR-1.

Uzbekistan: Teshik Tash 70 ka

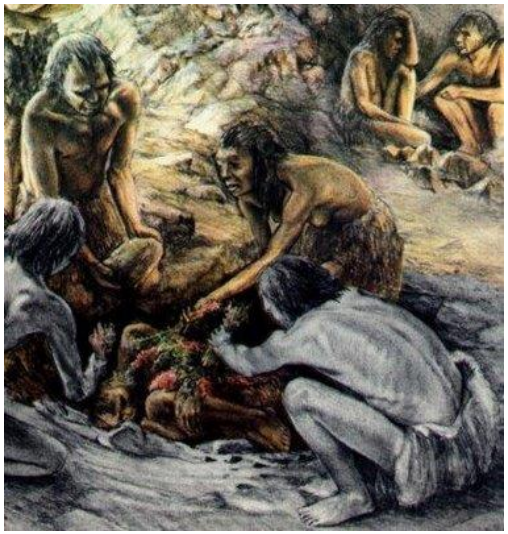


Iraq : Shanidar 50 ka BP



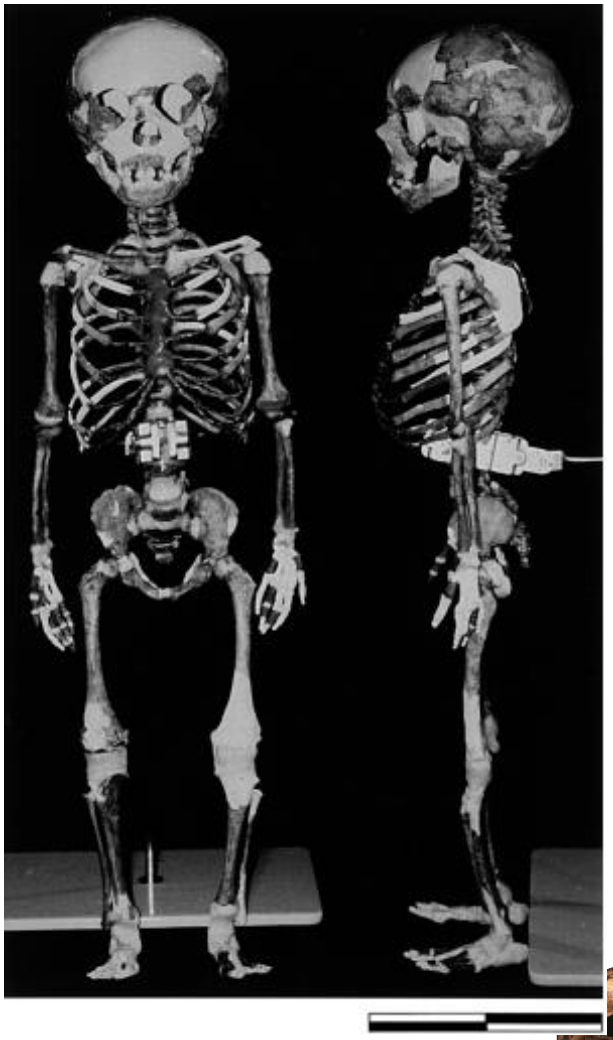
Shanidar 3: Lesione sulla 9 costa.

Shanidar 1



Syria : Dederyheh 50-60 ka BP

Prima sepoltura di bambini



Ricostruzione dello scheletro immaturo di 2 anni.

Israël: Kebara 48-60 ka BP

Sepolture Kebara II *Moshe*

Osso ioide di Kebara II

Ricostruzione dello scheletro di Kebara II

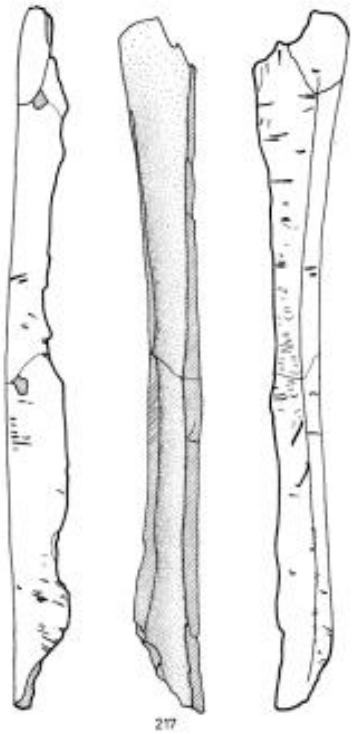
Israël: Amud 47 ka BP

Amud 1 circa 47.000 anni, il Neandertaliano più alto (174 cm) e con maggiore cc (1640 cm^3)

Croazia: Krapina 130 ka BP

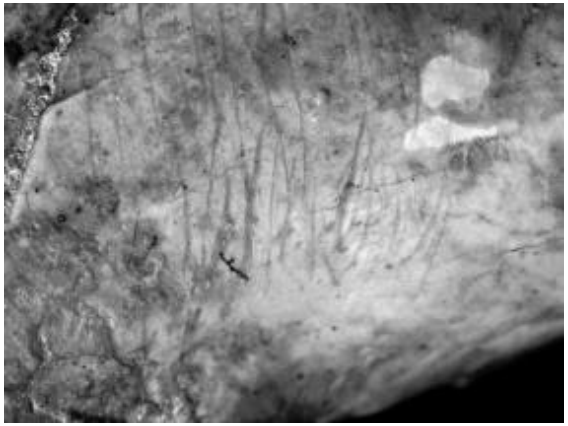
Krapina 12 : Frammento di osso occipitale giovanile

Krapina 59 : Mandibola



Tibia spaccata in 2 con tante cut marks.

emi-endocranio destro di Krapina 3

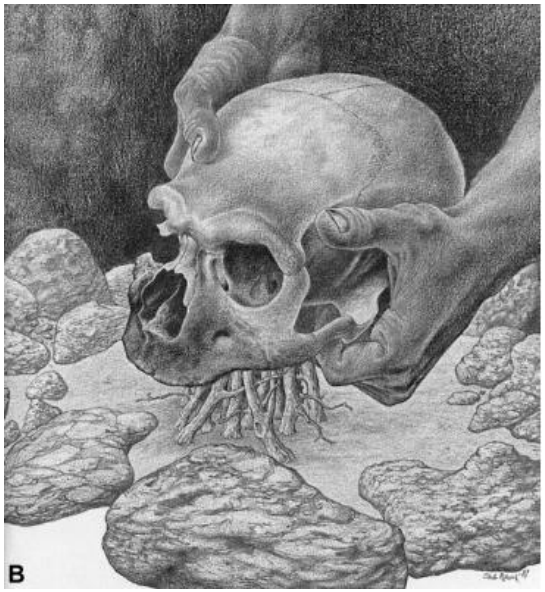


Cut marks nella sinfisi interna di K53.

Italia : Guattari 51-57 ka BP

Guattari 1

Guattari 2

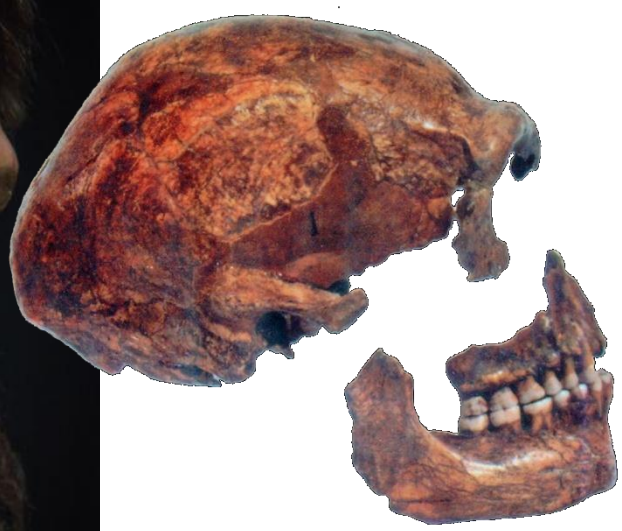


Ricostruzione ipotetica del culto del cranio

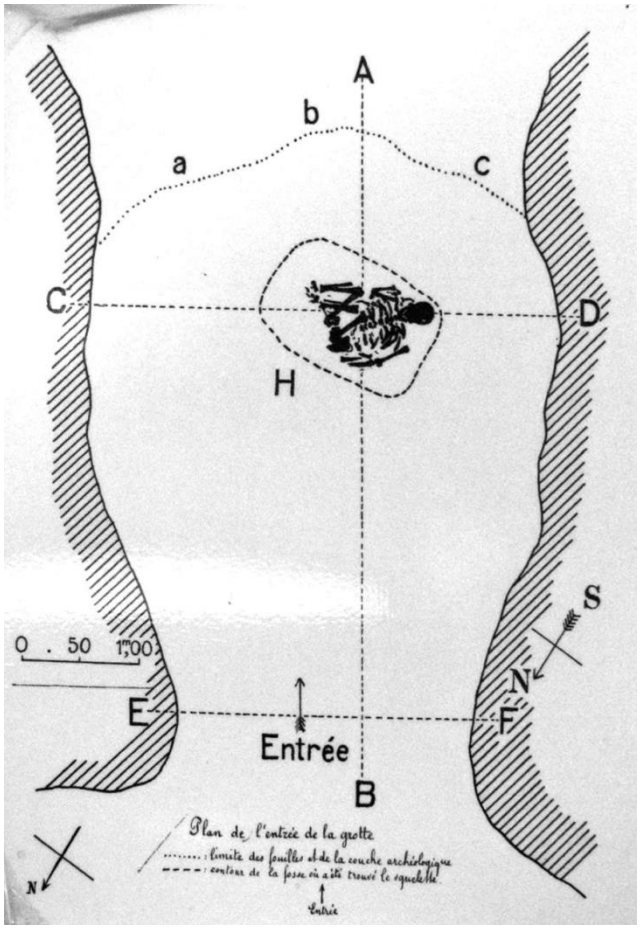
Belgio : Spy 40 ka BP

Engis 70 ka BP

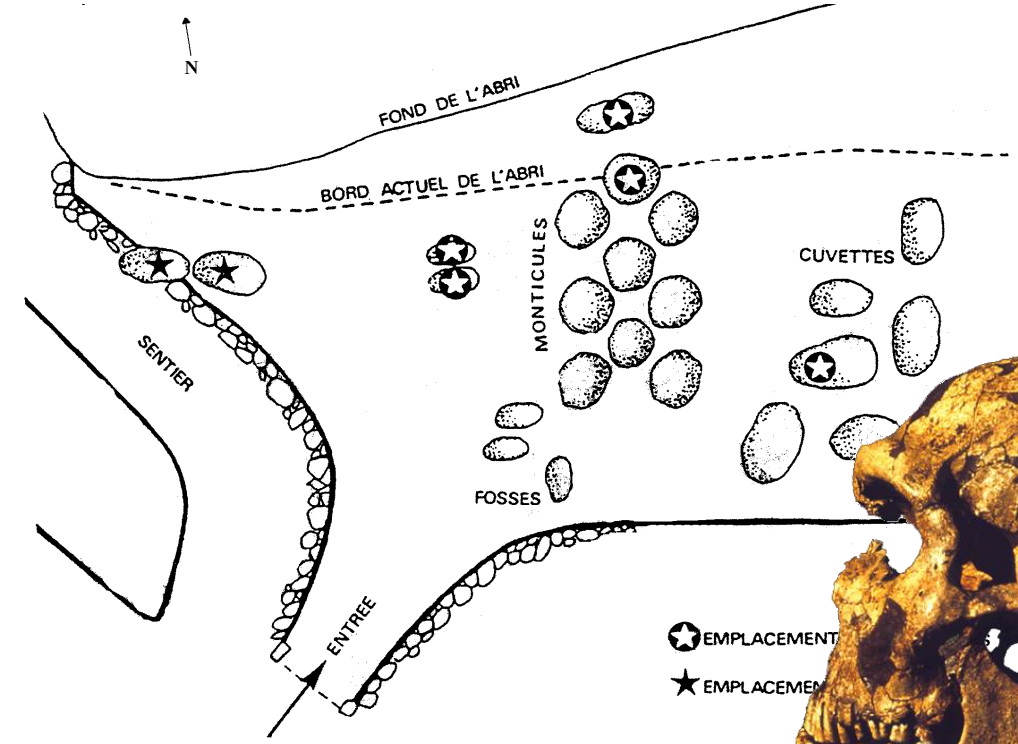
Engis 2

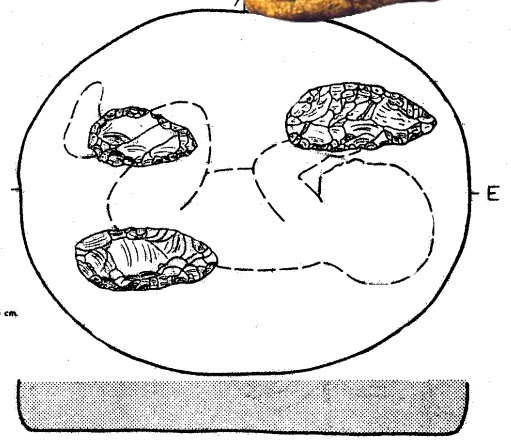


La Chapelle-aux-Saints (50 ka BP, Francia)

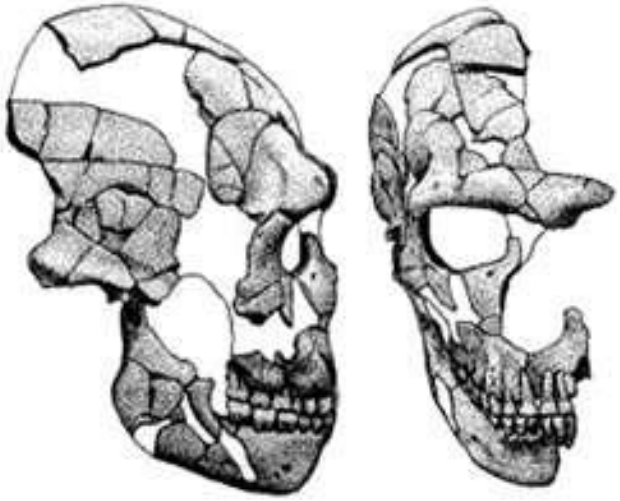


La Ferrassie (55 ka anni, Francia) – « Necropoli « di 8 schelettri



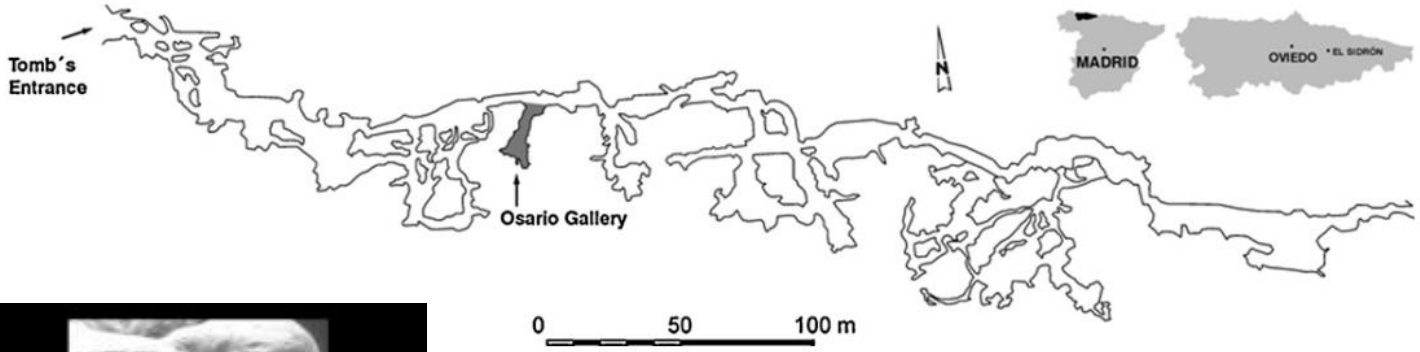


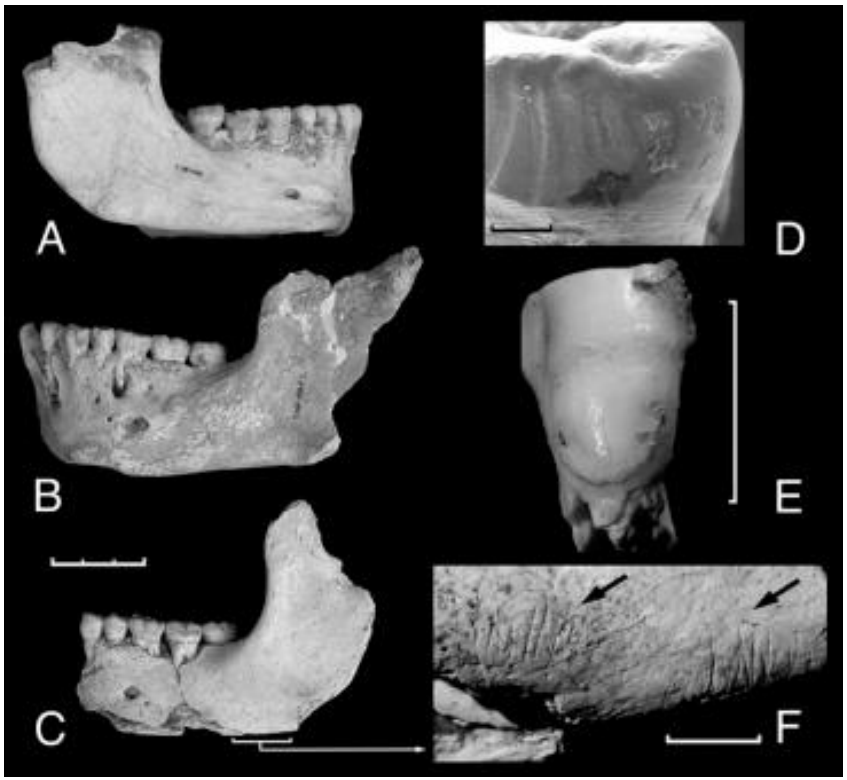
Francia : Saint-Césaire 36 ka BP



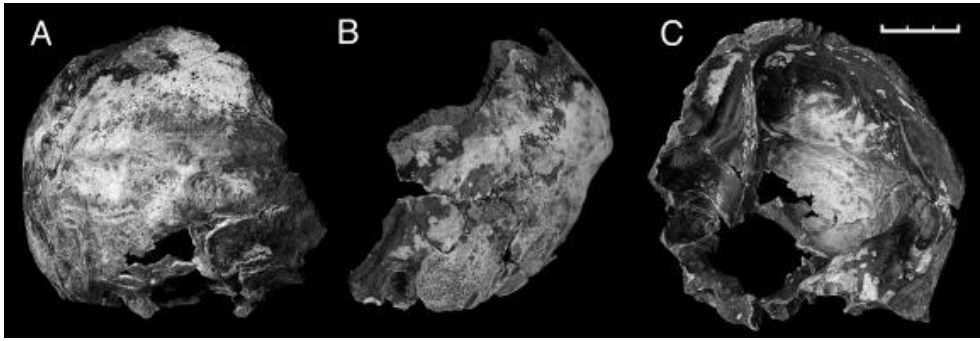
Cranio di Saint-Césaire 1

Spagna : El Sidron 43 ka BP



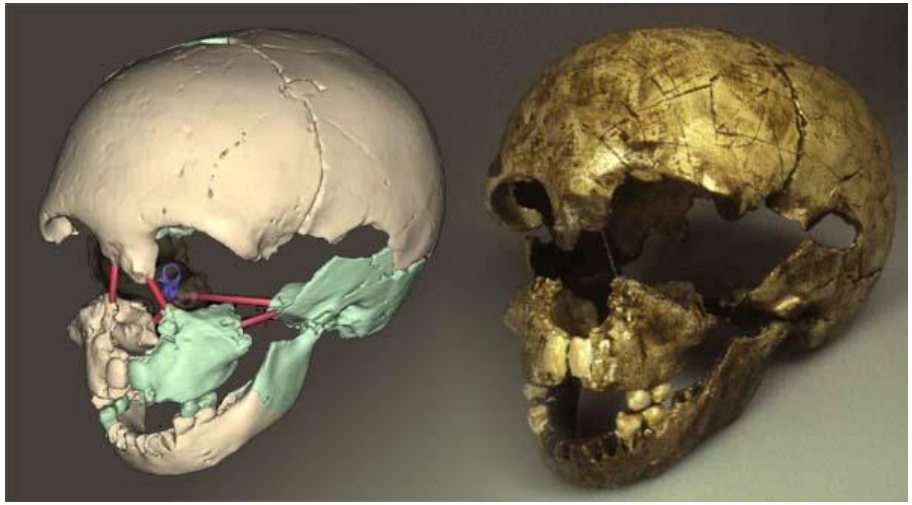


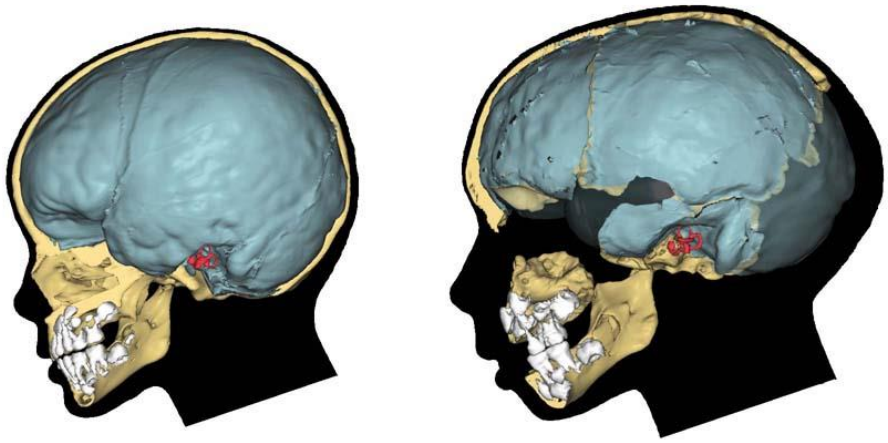
Mandibole con un'ipoplasia dello smalto e delle cut marks sul bordo basale (F)



SD-1219. Regione Occipitomastoide

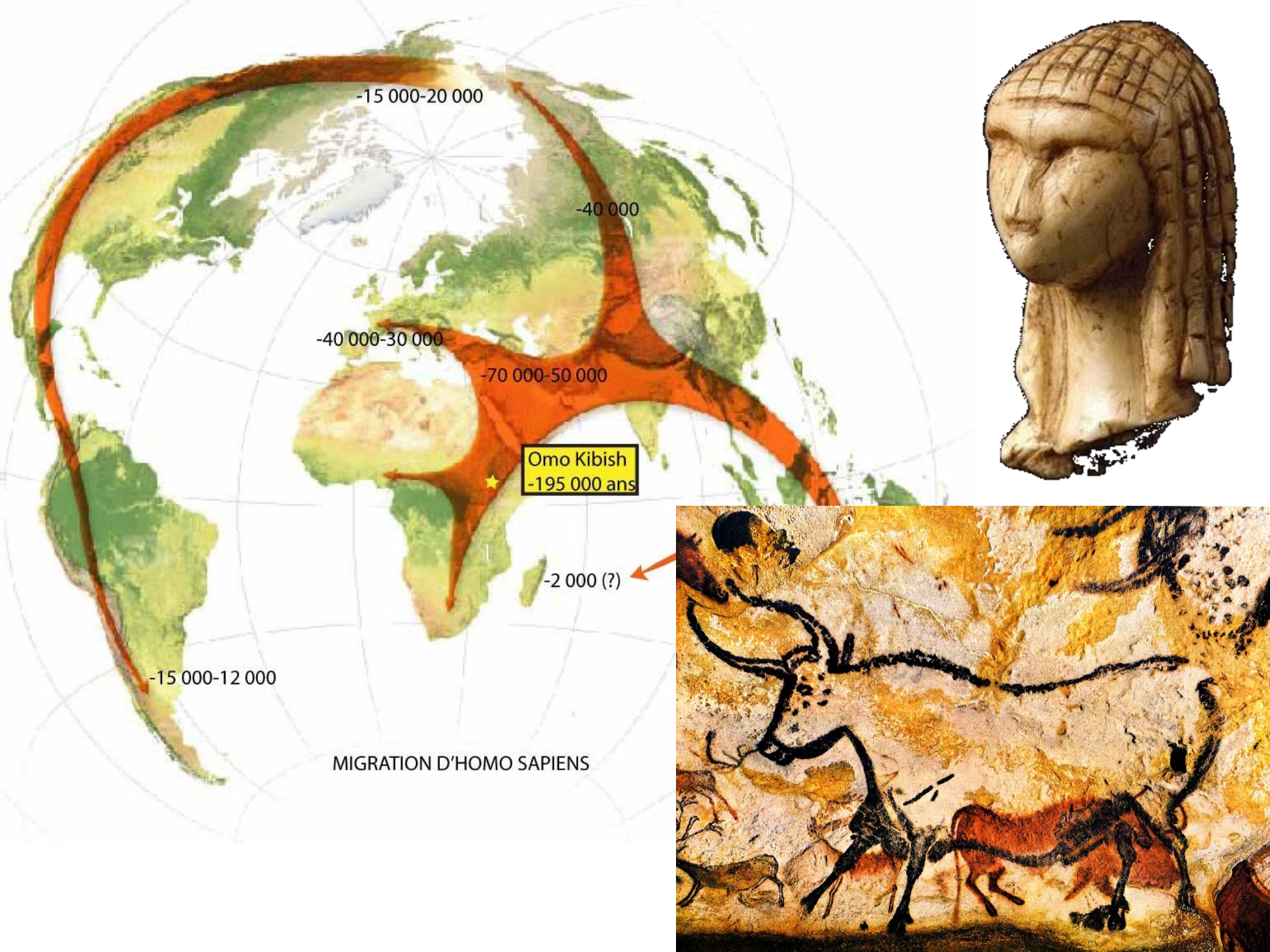
Spagna : Gibralatar Devil’s Tower 30 ka BP

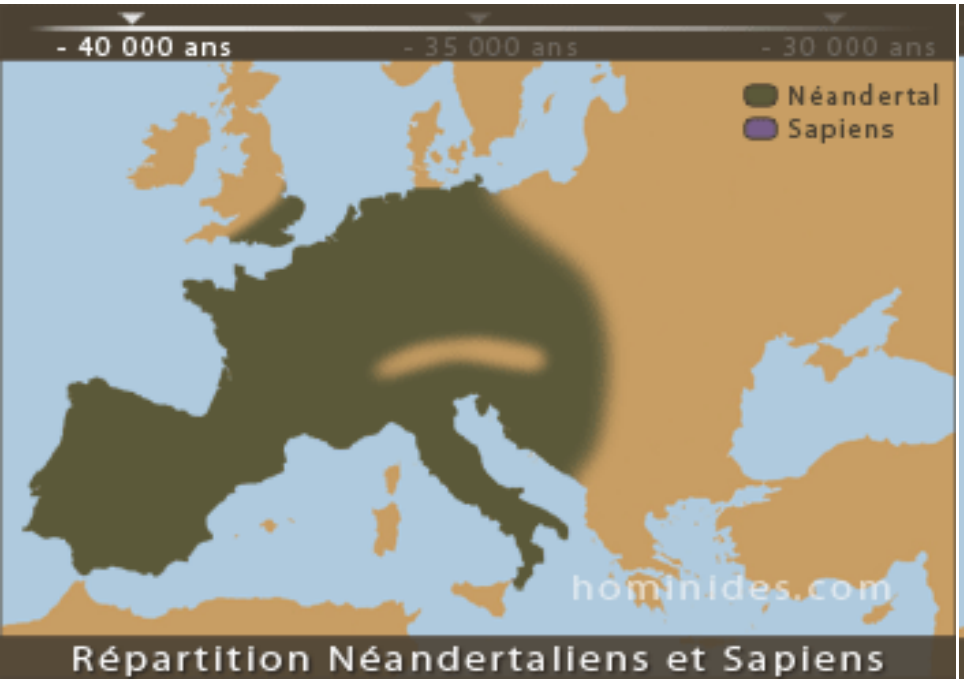


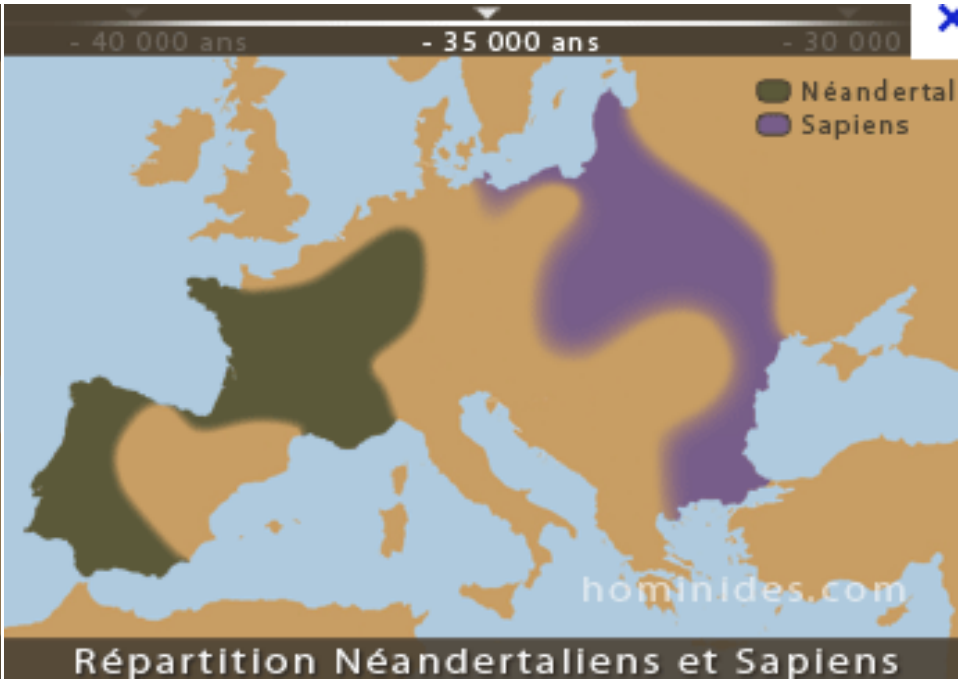


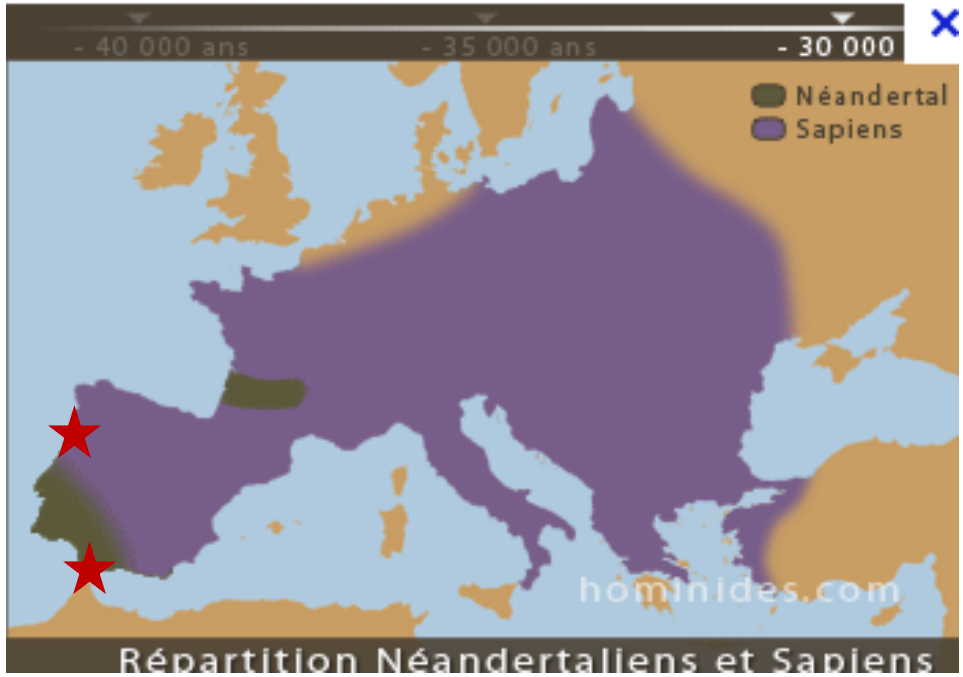
Gibraltar 2 : Cranio e ricostruzione

Estinzione


-15 000-20 000
-40 000
-40 000-30 000
-70 000-50 000
Omo Kibish
-195 000 ans
-2 000 (?)
-15 000-12 000
MIGRATION D'HOMO SAPIENS







nam's Cave
000 anni,
ibilterra)

Ipotesi…

Concorrenza con *Homo sapiens* che ha conquistato tutte le nicchie ecologiche.
The competition with Homo sapiens *who has colonized all the ecological niche.*

Homo sapiens è riuscito a estendere la caccia a vari tipi di prede
Homo sapiens *was able to extend the hunting to various types of prey..*

Combattimento tra *H.sapiens* e *H.neandertalensis* che si indeboliva.
Fight between H. sapiens *and* H.neanderthalensis *who get weaker.*

Genocidi dei Neandertaliani da parte dei *sapiens.*
Genocide of the Neandertal from the sapiens.

Fuga dei Neandertaliani che rifiutavano il confronto con i Cro-Magnon. Questa cultura pacifica e la mortalità infantile elevata sarebbe all'origine della loro scomparsa.
Escape of the Neandertal who refused the confrontation with the Cro-Magnon. *This pacific culture and the child mortality could have been the reason to their extinction.*

Malattie *Deseases*

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