

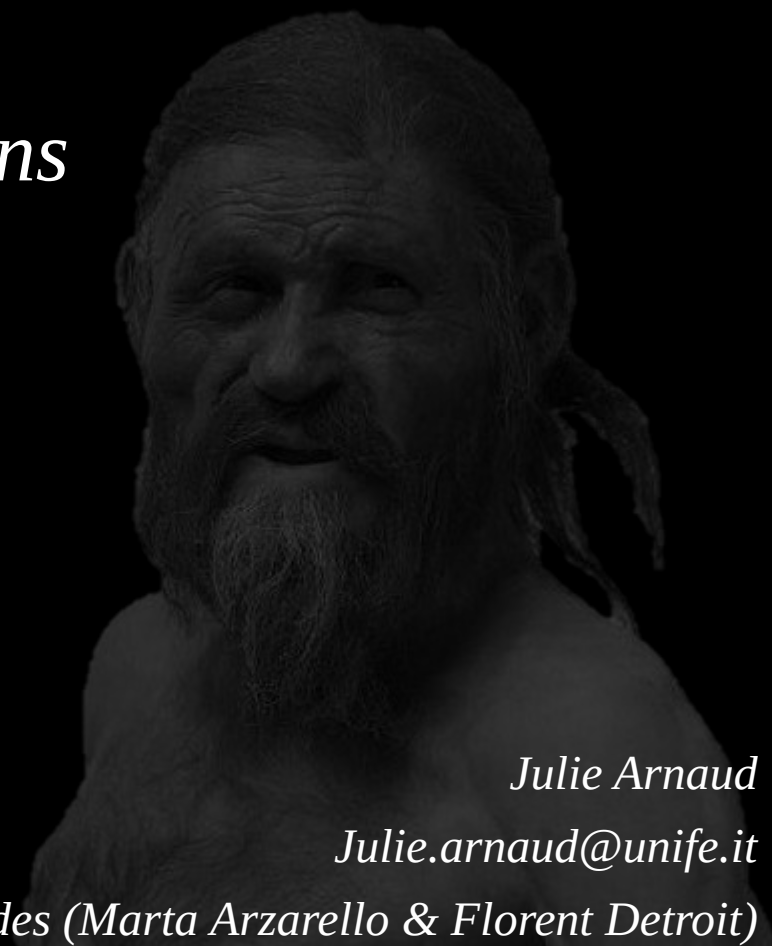


Erasmus Mundus

Laurea Magistrale in QUATERNARIO, PREISTORIA E ARCHEOLOGIA

Master in PREISTORIA E QUATERNARIO

Homo sapiens



Julie Arnaud

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Slides (Marta Arzarello & Florent Detroit)

Definizione della specie *Homo sapiens* basata sui criteri morfologici (Definizione paleontologica della specie)



Day & Stringer (1982)

- Volta cranica corta ed elevata
- Ossa parietali nel piano sagittale lunghi e curvi
- Volta parietale nel piano coronale alta e larga
- Osso occipitale lungo e stretto, senza proiezione
- Osso frontale elevato
- Complesso sopra-orbitale non continuo
- Presenza di una fossa canina

Vandermeersch (1981, 2005)

- Forma arrotondata del cranio
- Capacità cranica elevata
- Diminuzione della robustezza (riduzione / scomparsa delle superstrutture)
- Volta cranica elevata, con le pareti laterali parallele o divergente (verso l'alto)
- Osso occipitale regolarmente arrotondato
- Faccia corta
- Tendenza ad una riduzione delle dimensioni dentarie

Definition of the species *Homo sapiens* based on morphological criteria (palaeontological definition of the species)

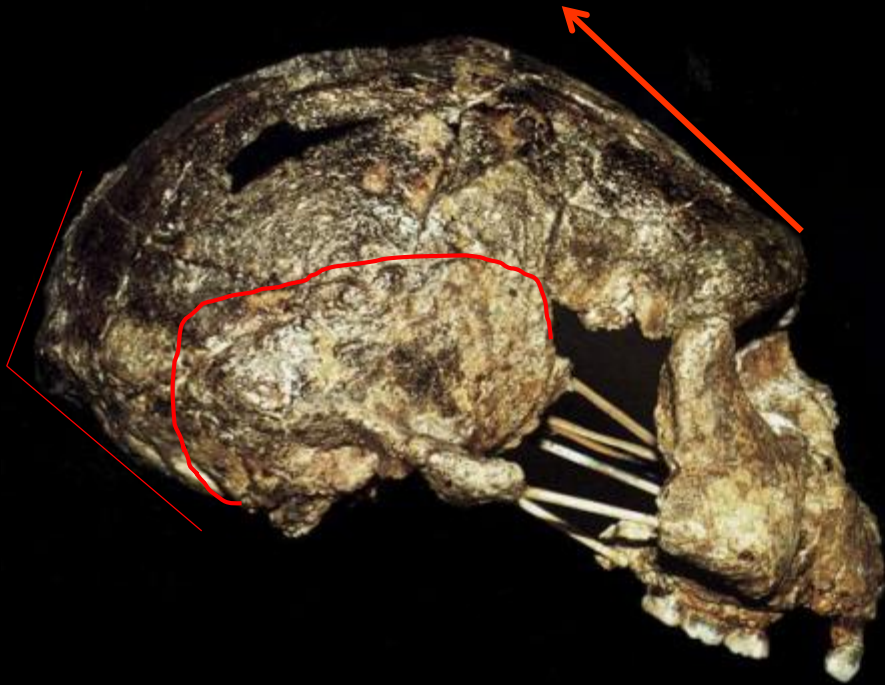


Day & Stringer (1982)

- Short and elevated cranial vault
- Long and curved parietal bones in the sagittal plan
- High and wide biparietal vault in the coronal plan
- Long and narrow occipital bone, without projection
- Elevated frontal bone
- Non-continuous supra-orbital complex
- Presence of a canine fossa

Vandermeersch (1981, 2005)

- rounded cranial shape
- large cranial capacity
- decreased robustness (reduction/disappearance of superstructures)
- elevated cranial vault, with parallel or divergent (upward) lateral walls
- regularly rounded occipital bone
- short face
- teeth-size reduction tendency

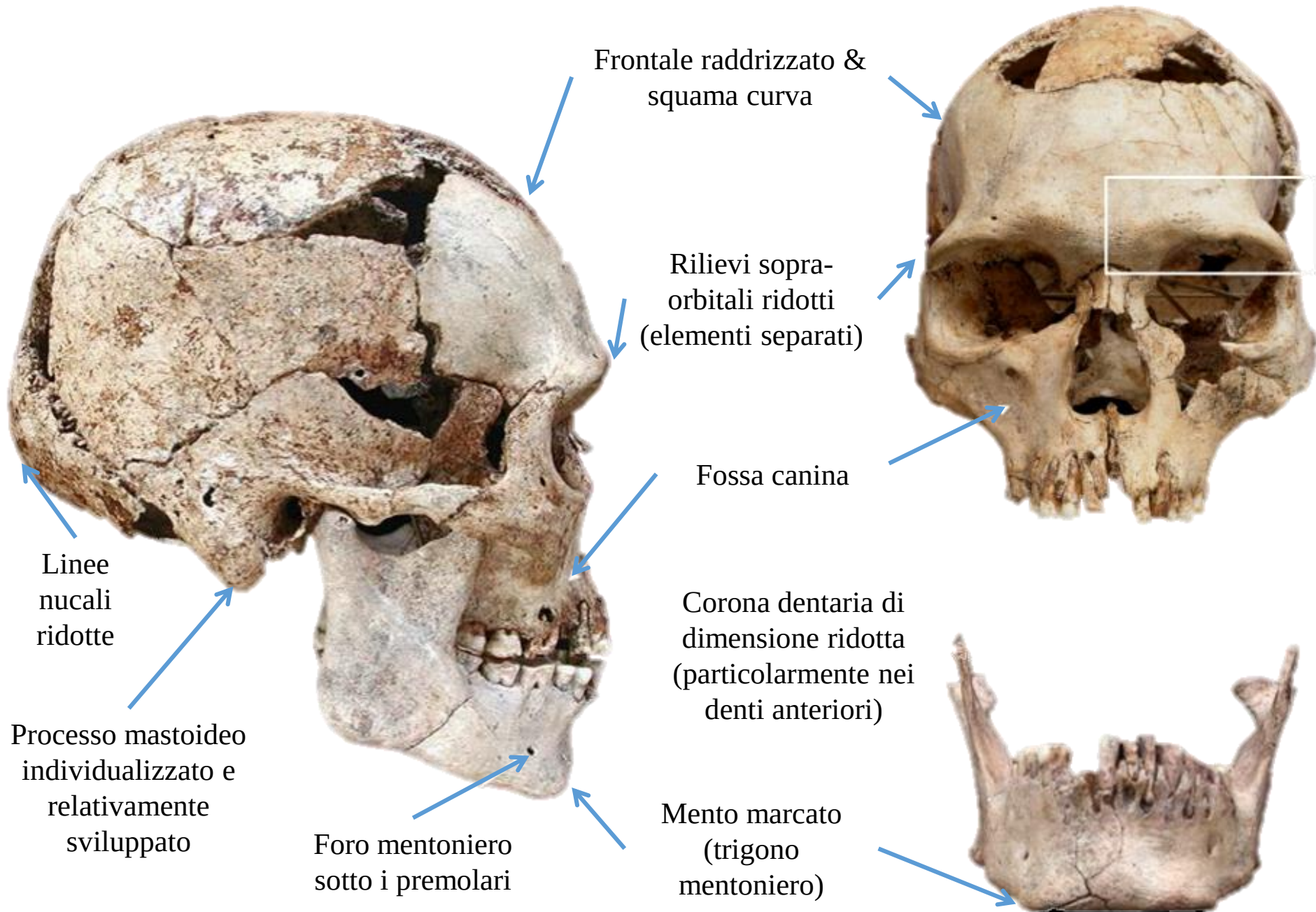


1. Short & rounded vault
2. Elevated frontal & convexity of the scala
3. Rounded ("open") occipital bone
4. Reduced face, placed under the braincase

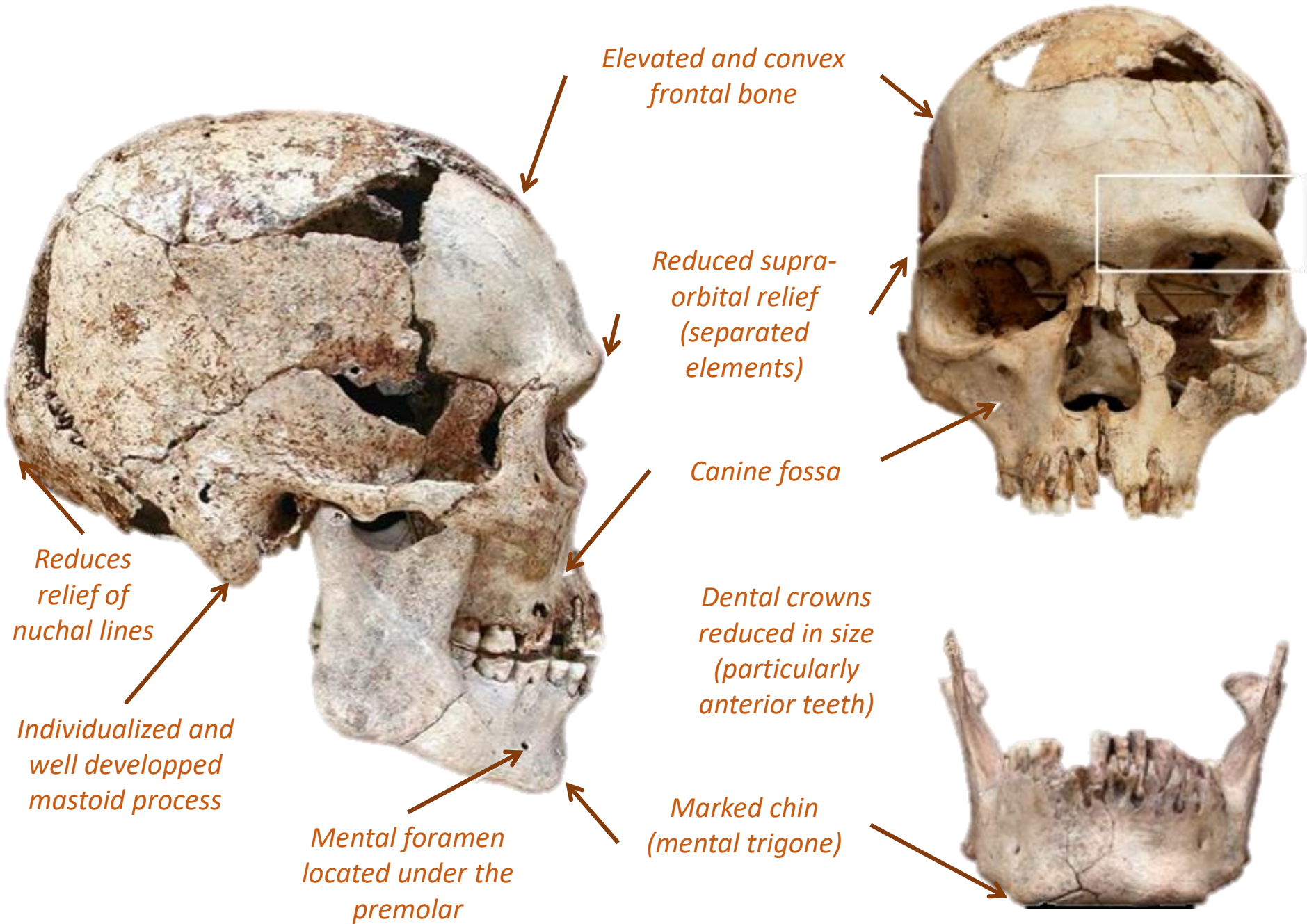
1. Volta cranica corta e arrotondata
2. Frontale elevato & squama convessa
3. Occipitale arrotondato (« aperto »)
4. Faccia ridotta, situata sotto la scatola cranica

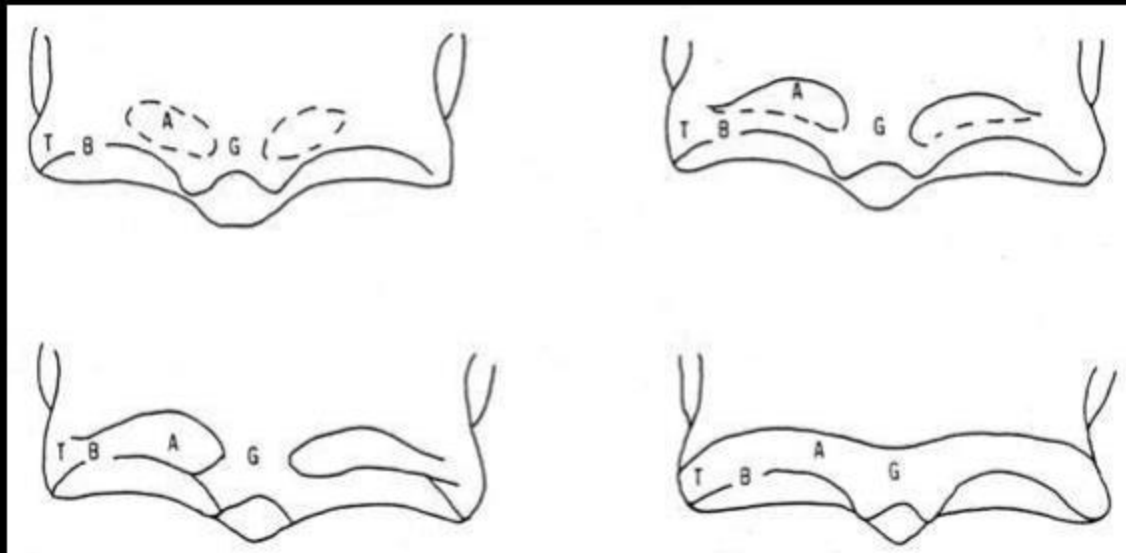
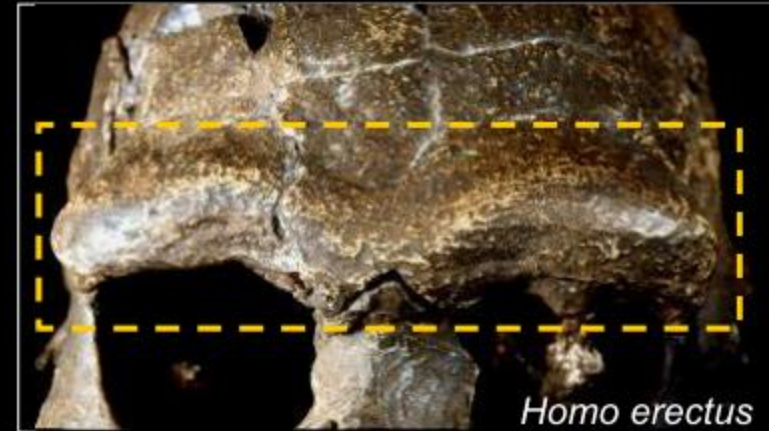
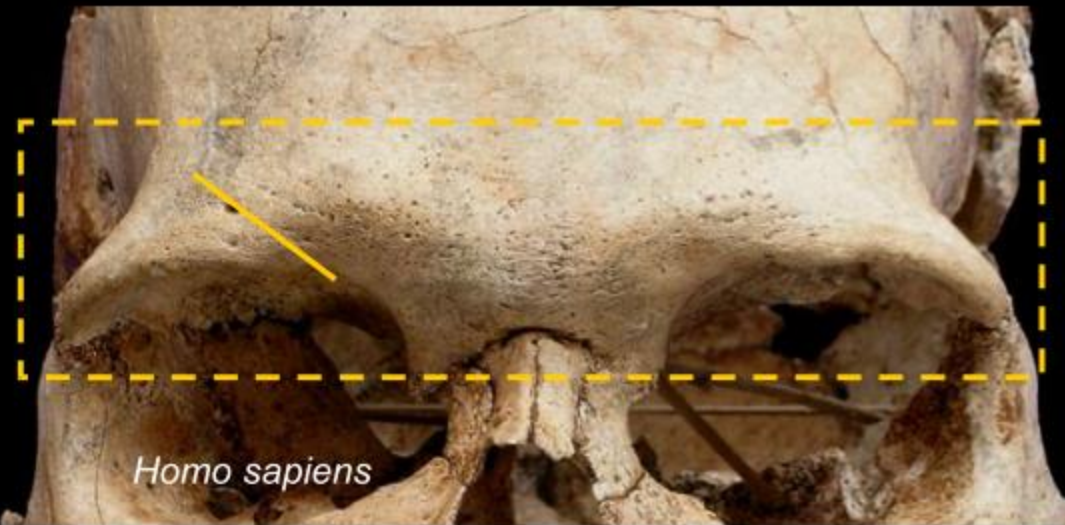


Riduzione globale della robustezza



Global decrease of robustness

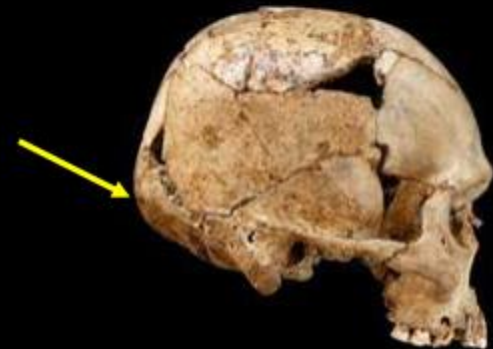
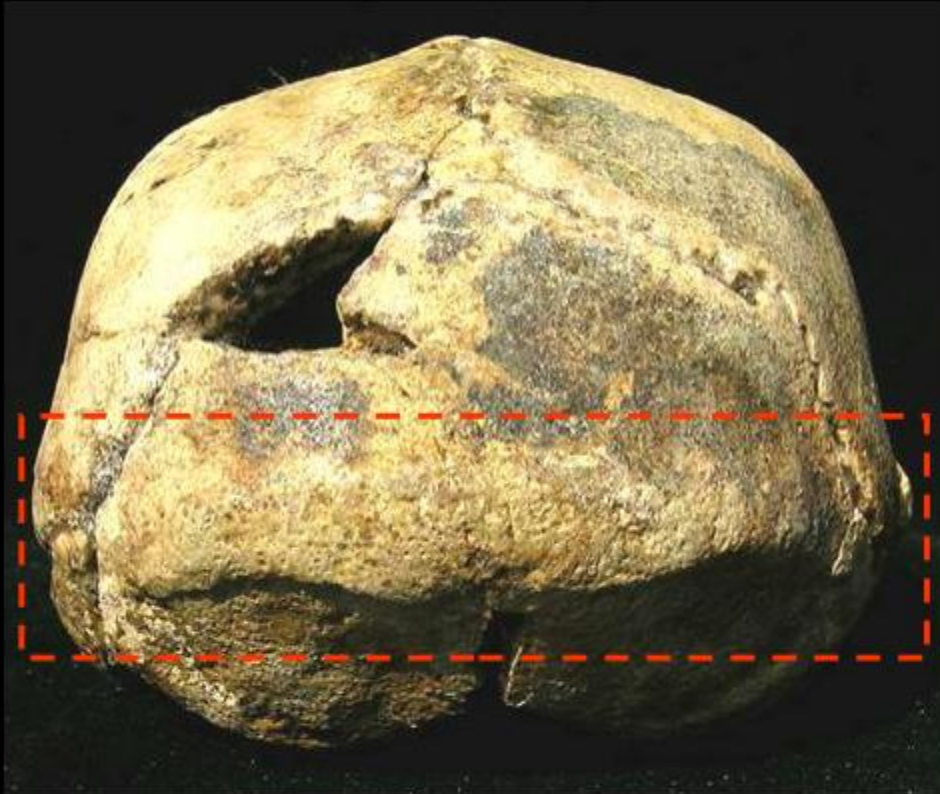




G : Glabella
 A : superciliary arch
 B : upper border of the orbit
 T : lateral trigone

G: Glabella
 A: Arcata sopraciliare
 B: Bordo orbitale superiore
 T: Trigone

Transverse occipital torus



- narrow trunk and pelvis
- low body mass compared to stature
- center of gravity at the level of the 2° sacral vertebra
- vertebral column with marked secondary convexities
- long limbs compared to trunk
- robust and lengthened lower limbs
- lengthening of the distal segments of the limbs
- reduced thickness of cortical bone and large medullar cavity (compared to *Homo erectus*)

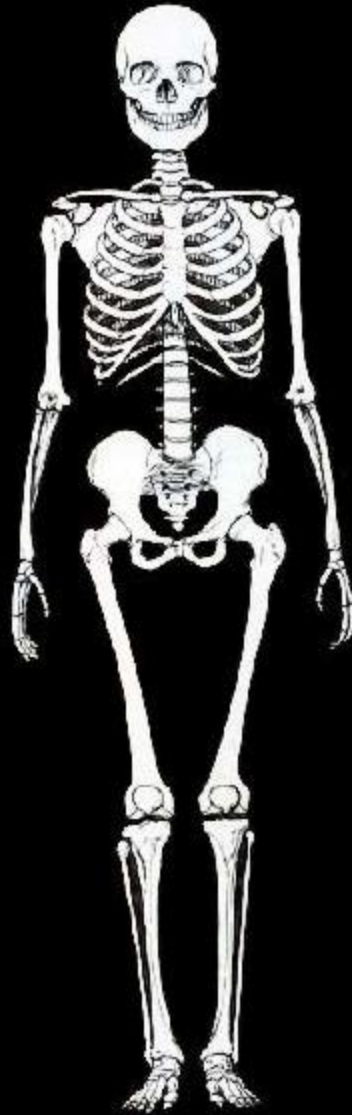


- Tronco e bacino stretti
- Massa corporea poco elevata in confronto alla statura
- Centro di gravita situato al livello della seconda vertebra sacra
- Colonna vertebrale a convessità secondarie (verso l'avanti) marcate
- Arti lunghi in confronto al tronco
- Arti inferiori robusti ed allungati
- Allungamento delle porzione distale dei arti
- Spessore ridotta dell'osso corticale ed allargamento delle cavita midollare in confronto a *Homo erectus*

Nebraska
Venus 510011
Feb. 08



Homo neanderthalensis



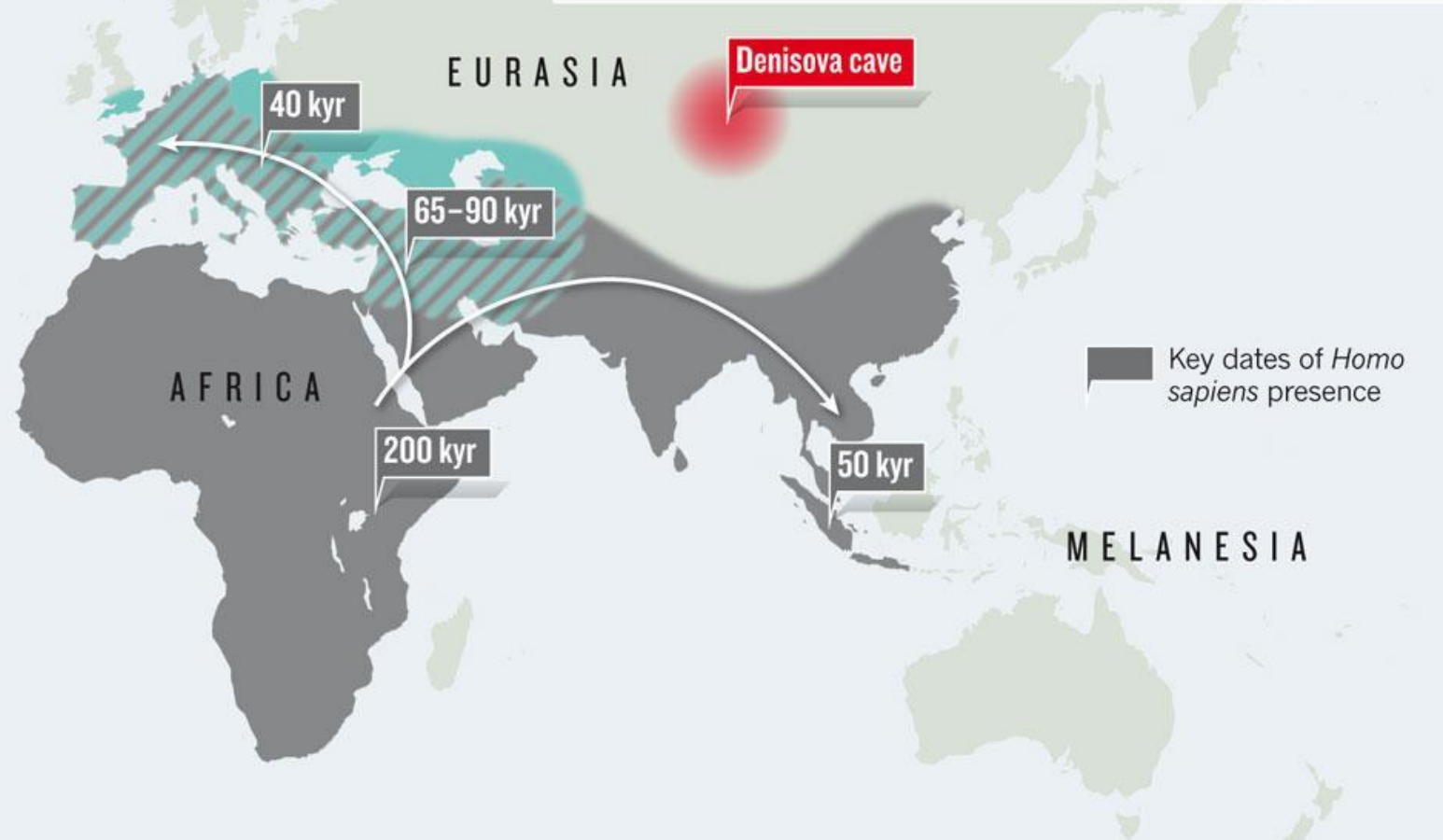
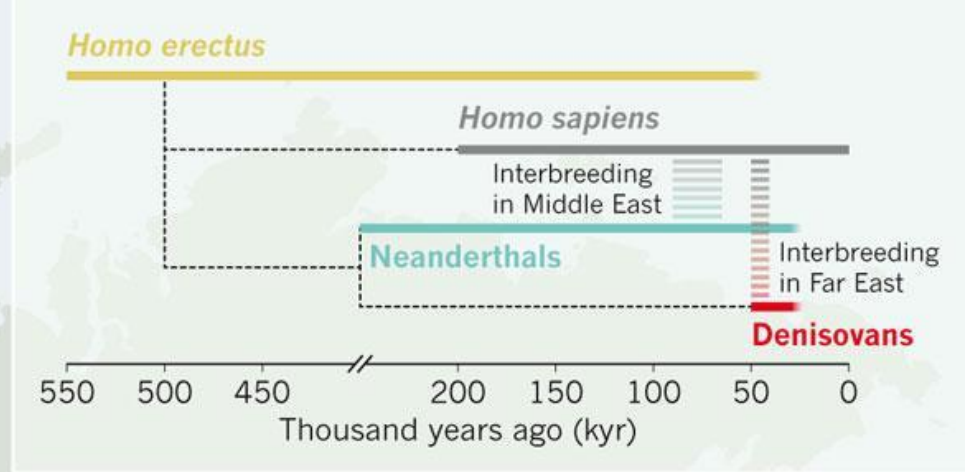
Homo sapiens

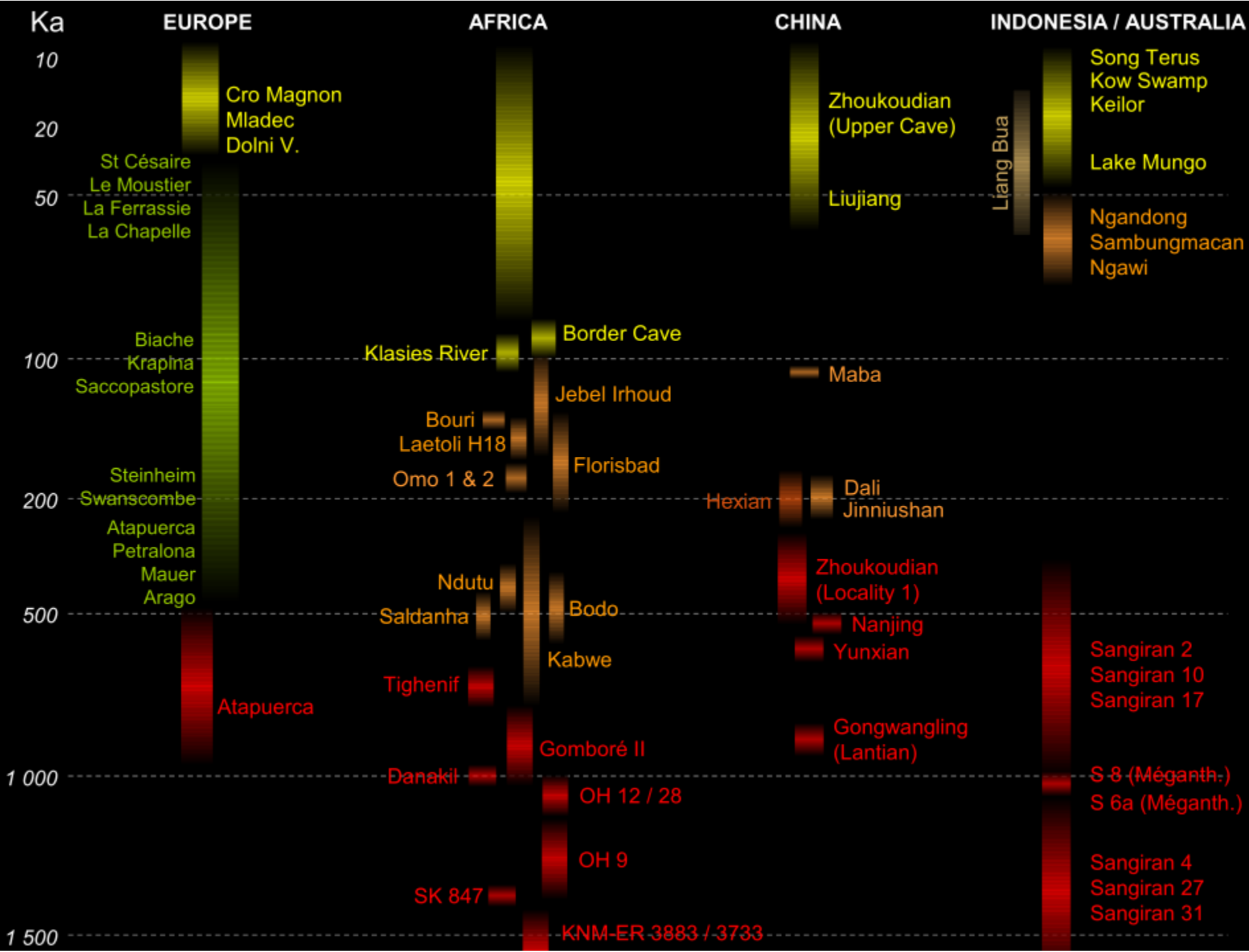


Homo ergaster

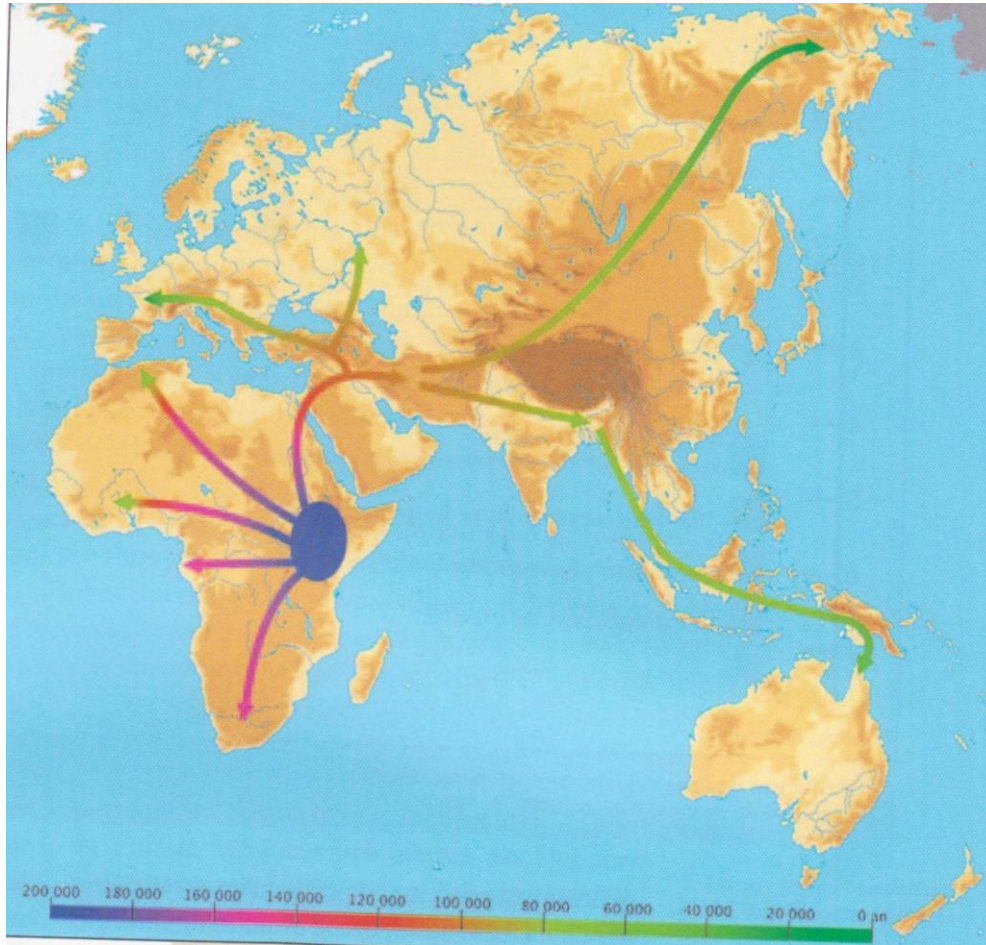
THE HUMAN STRAIN

As *Homo sapiens* evolved and migrated across the world, they apparently interbred with archaic humans such as Neanderthals and Denisovans.



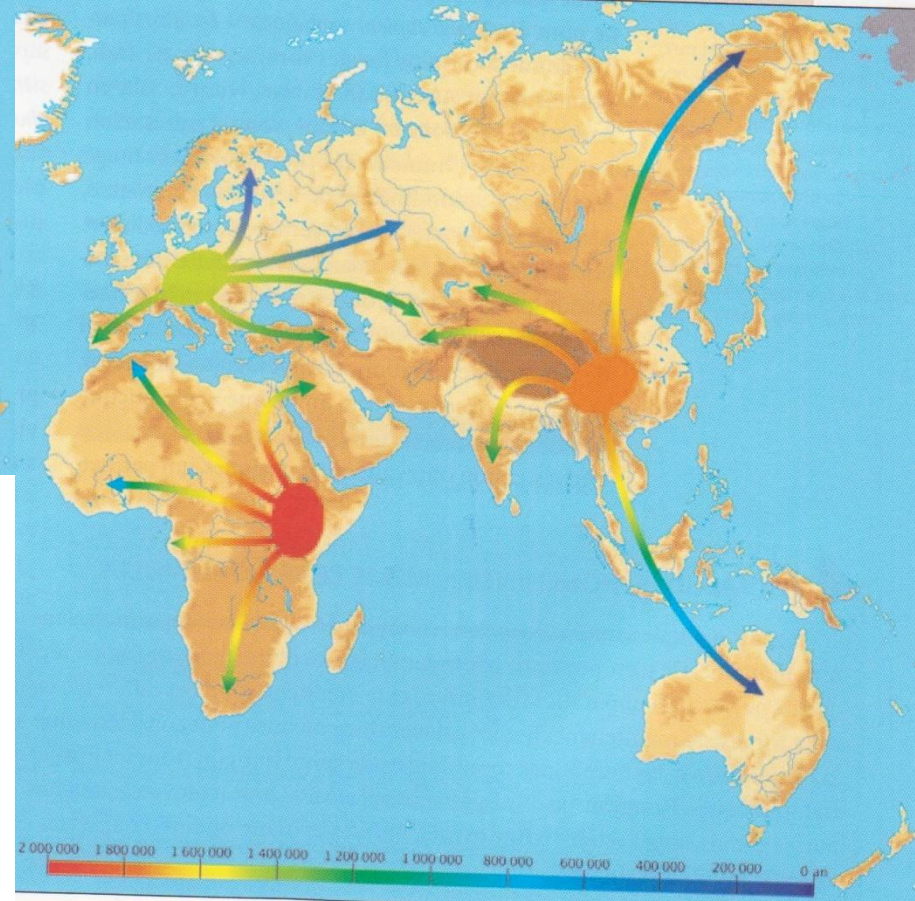


Origine

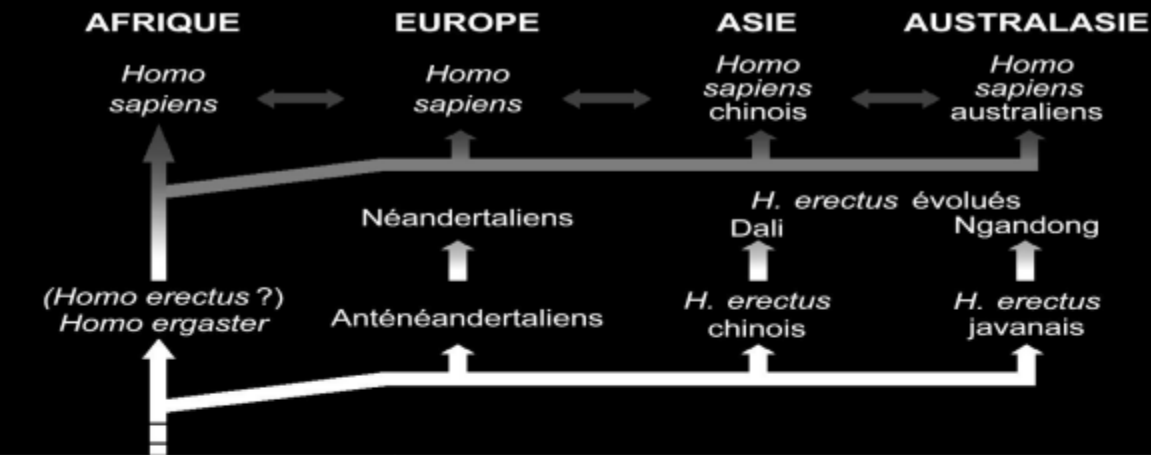


Modello « Out of Africa » o modello
di sostituzione
« *Out of Africa* » *model or replacement*
model

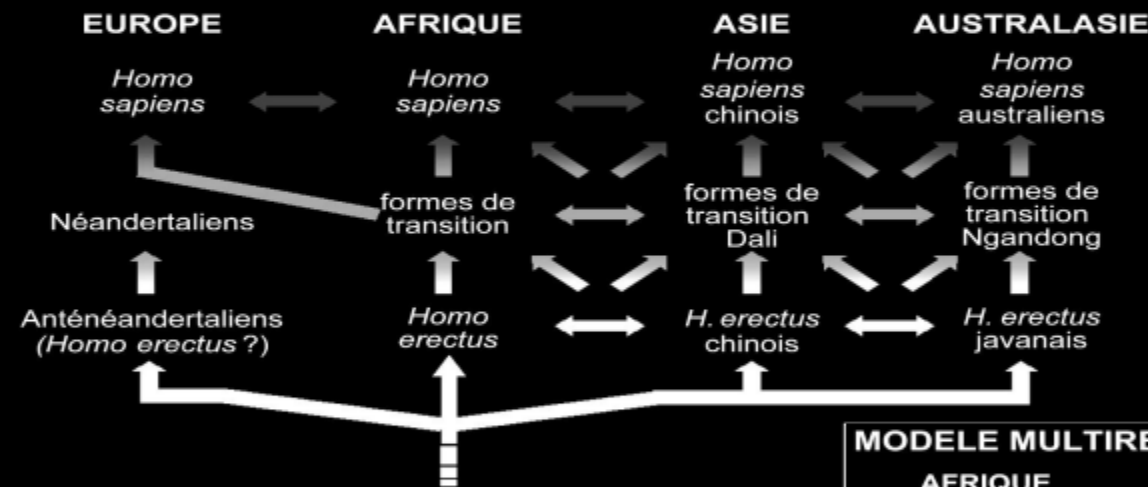
Modello multiregionale
Multiregional model



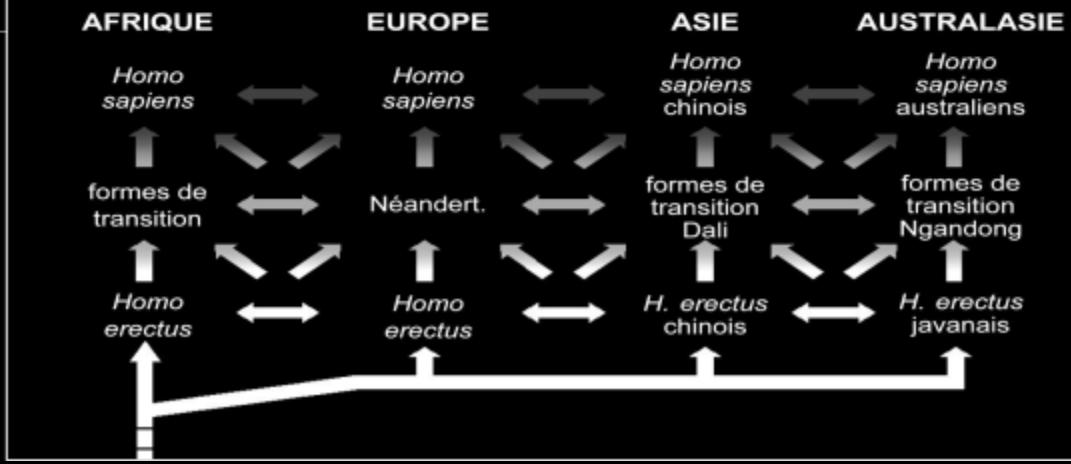
MODELE AVEC REMPLACEMENT



MODELE INTERMEDIAIRE



MODELE MULTIREGIONAL



Modello del Multiregionalismo

Le principali basi della teoria multiregionalista sono:

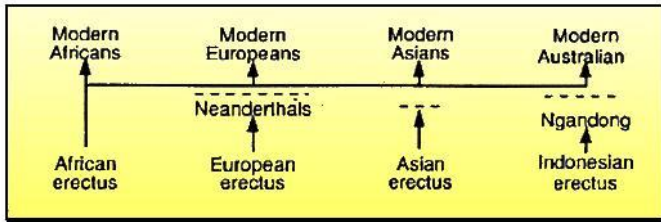
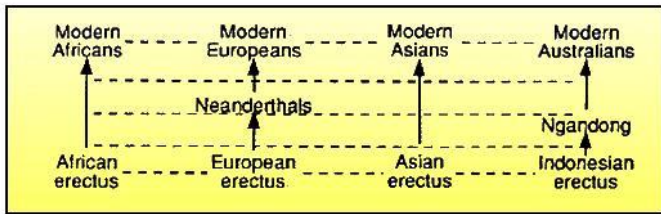
- Specifiche similitudini regionali tra le forme arcaiche di *Homo sapiens* e quelle moderne;

Le principali critiche al multiregionalismo sono:

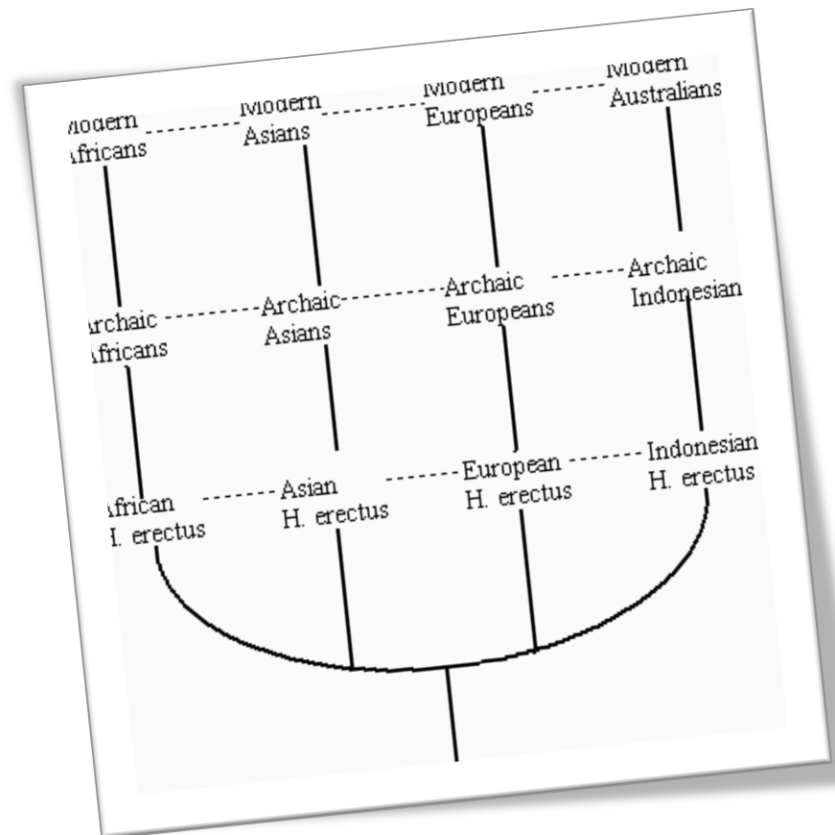
- Assenza di forme di transizione in Asia e Europa

- Prove genetiche

- La teoria richiede un continuo *gene flow* tra le popolazioni regionali



Two views of the origins of modern humans: the multiregional model (top) and the "Out of Africa" model. Each interprets the same fossil evidence in a radically different way



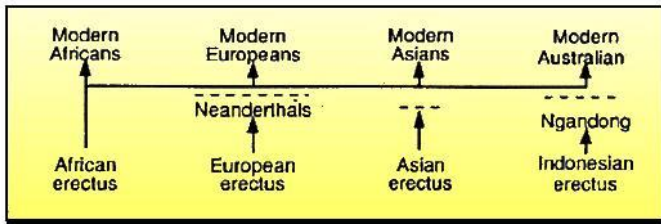
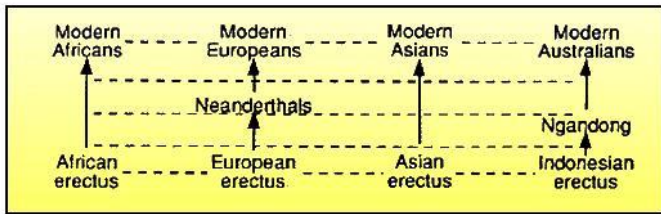
Multiregionalism model

The principal bases of the multiregional theory are:

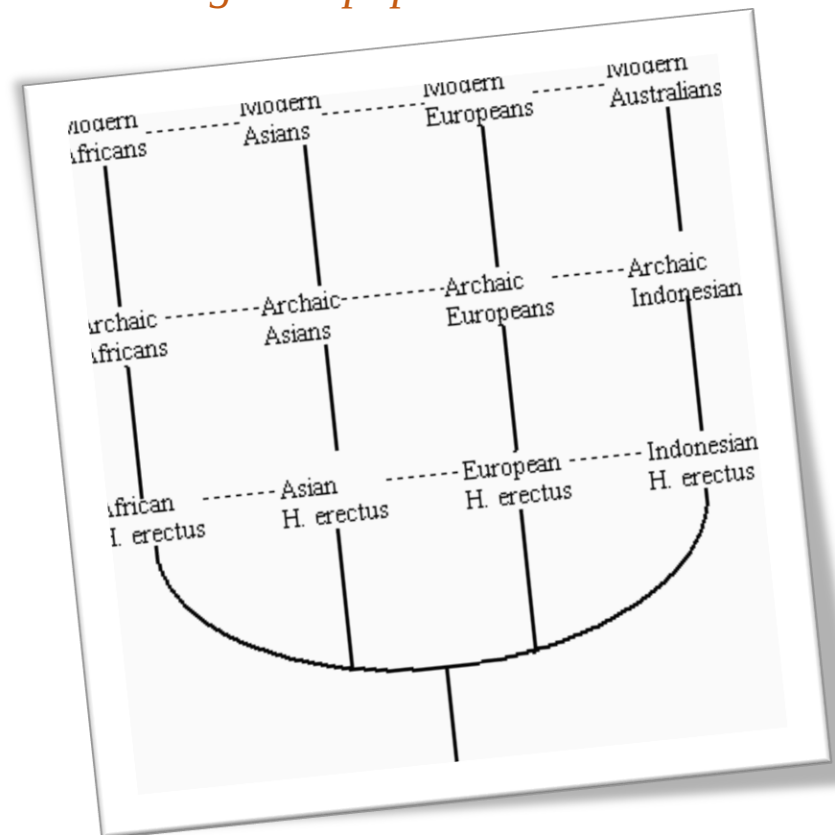
- Specific regional similarity between archaic *Homo sapiens* and modern one;

Principal criticism :

- Lack of transizione shape in Asia and Europe
- Genetical proof
- This theory request a continuous gene flow between the regional population



Two views of the origins of modern humans: the multiregional model (top) and the "Out of Africa" model. Each interprets the same fossil evidence in a radically different way



Modello della “sostituzione parziale”

Teoria dell'assimilazione (Smith 1987) o del parziale rimpiazzo:
assimilazione da parte delle popolazioni europee del patrimonio genetico dell'uomo moderno, per flusso genico*. Prove paleontologiche: fossili dell'Europa orientale (Vindija)

Teoria dell'ibridazione (Trinkaus): incrocio nelle varie aree geografiche dell'umanità moderna con le popolazioni preesistenti.

*Il **flusso genico** è la diffusione dei geni fra popolazioni, per migrazioni di individui in età riproduttiva. Il flusso genico può introdurre in una popolazione nuovi alleli o può cambiare le frequenze alleliche. L'effetto globale del flusso genico è quello di ridurre le differenze genetiche medie tra le popolazioni e quindi di limitarne l'evoluzione. D'altra parte, il flusso genico può aumentare la variabilità interna di una popolazione, aumentandone il polimorfismo.

Partial substitution model

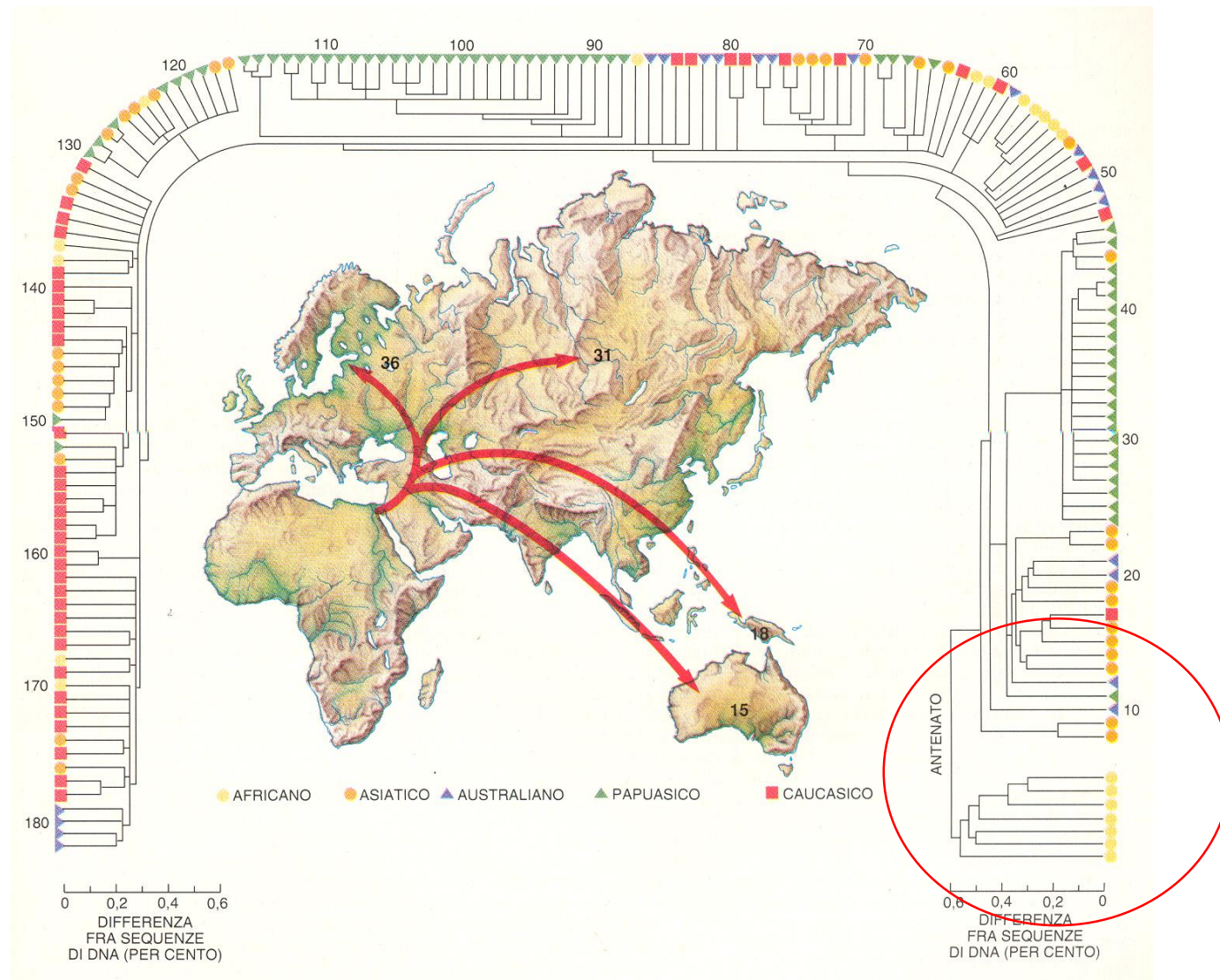
Theory of integration (Smith, 1987) or partial replace:

Integration from european population of the genetic patrimoni of modern human, bu genetic flow. Paleontological proof: fossils from eastern Europe (Vindija)*

Hybridation theory (Trinkaus): *Interbreeding in the various geographic area of modern human and preexisting population*

**Genetic flow is the diffusion of gene between population, by migration of individual in reproductive aige. The genetic flow can introduce in a population new allele and can change the allelic frequency. The global genetic effect is the reduction of genetic differences between population and then limit the evolution. In another hand, genetic flow can increase the internal variabilità of a population, increasing the polymorphism.*

Le prove genetiche / *Genetic evidence*

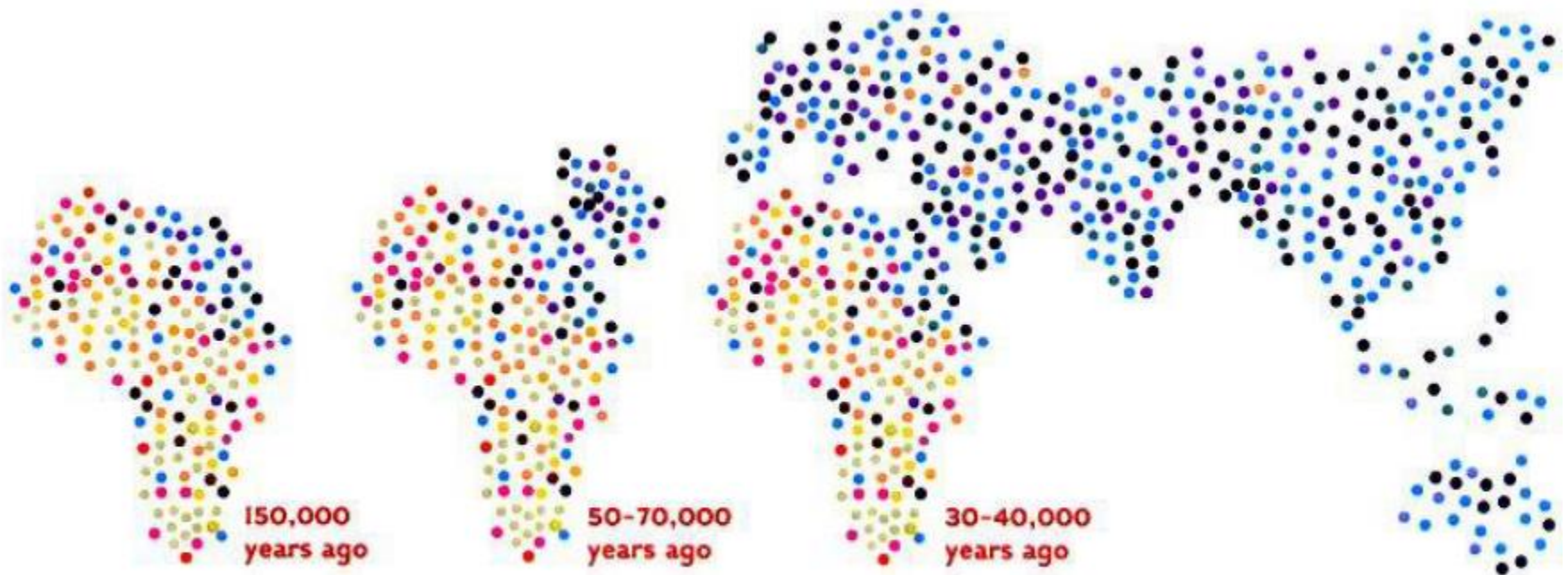


L'origine africana dell'uomo moderno desunta dalla studio del DNA mitocondriale attuale

The african origin of modern human evidencied by the study of actual mitochondrial DNA

Variabilità del mtDNA attuale

« Tutta la variabilità del mtDNA umano attuale e mondiale è anche presente in Africa (Africa dell'Est), quindi sarebbe il posto più probabile dell'origine della specie *Homo sapiens*. »

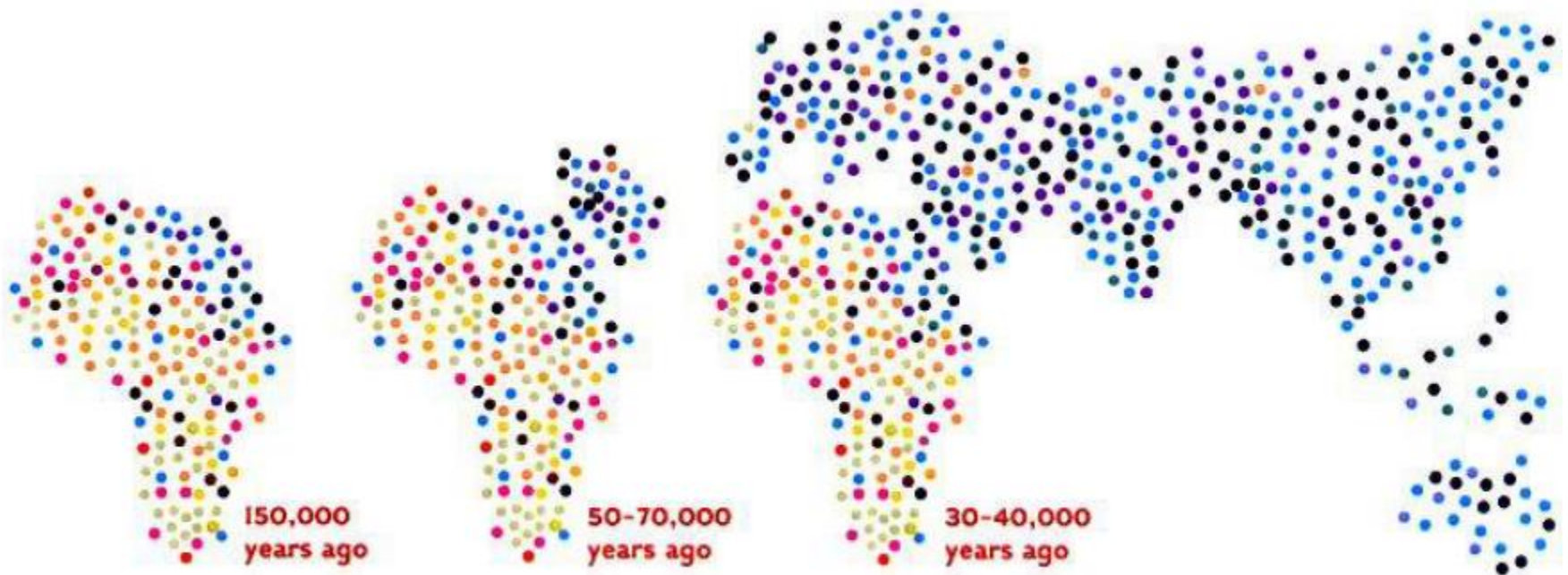


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Diversità di un segnale genetico immaginario (schema)

Present variability mtDNA

« all the contemporary and worldwide human mtDNA variability is also present in Africa (East Africa), thus it is the most probable place of origin of the species *Homo sapiens*. »



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Diversity of one imaginary mitochondrial genetic marker (schematic picture)

An early modern human from Romania with a recent Neanderthal ancestor

Putative recent Neanderthal ancestry

Qiaomei Fu^{1,2,3*}, Mateja Hajdinjak^{3*}, Oana Teodora Moldovan⁴, Silviu Constantin⁵, Swapan Mallick^{2,6,7}, Pontus Skoglund², Nick Patterson⁶, Nadin Rohland², Iosif Lazaridis², Birgit Nickel³, Bence Viola^{3,7,8}, Kay Prüfer³, Matthias Meyer³, Janet Kelso³, David Reich^{2,6,9} & Svante Pääbo³

Neanderthals are thought to have disappeared in Europe approximately 39,000–41,000 years ago but they have contributed 1–3% of the DNA of present-day people in Eurasia¹. Here we analyse DNA from a 37,000–42,000-year-old² modern human from Peștera cu Oase, Romania. Although the specimen contains small amounts of human DNA, we use an enrichment strategy to isolate sites that are informative about its relationship to Neanderthals and present-day humans. We find that on the order of 6–9% of the genome of the Oase individual is derived from Neanderthals, more than any other modern human sequenced to date. Three chromosomal segments of Neanderthal ancestry are over 50 centimorgans in size, indicating that this individual had a Neanderthal ancestor as recently as four to six generations back. However, the Oase individual does not share more alleles with later Europeans than with East Asians, suggesting that the Oase population did not contribute substantially to later humans in Europe.





**Date of Fossil
(years ago)**

East Africa:

Herto, Middle Awash	160,000-154,000
Omo 1	195,000
Laetoli	120,000

South Africa:

Border Cave	115,000-90,000
Klasies River Mouth	90,000

Israel:

Skhul and Qafzeh	92,000-90,000
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Australia:

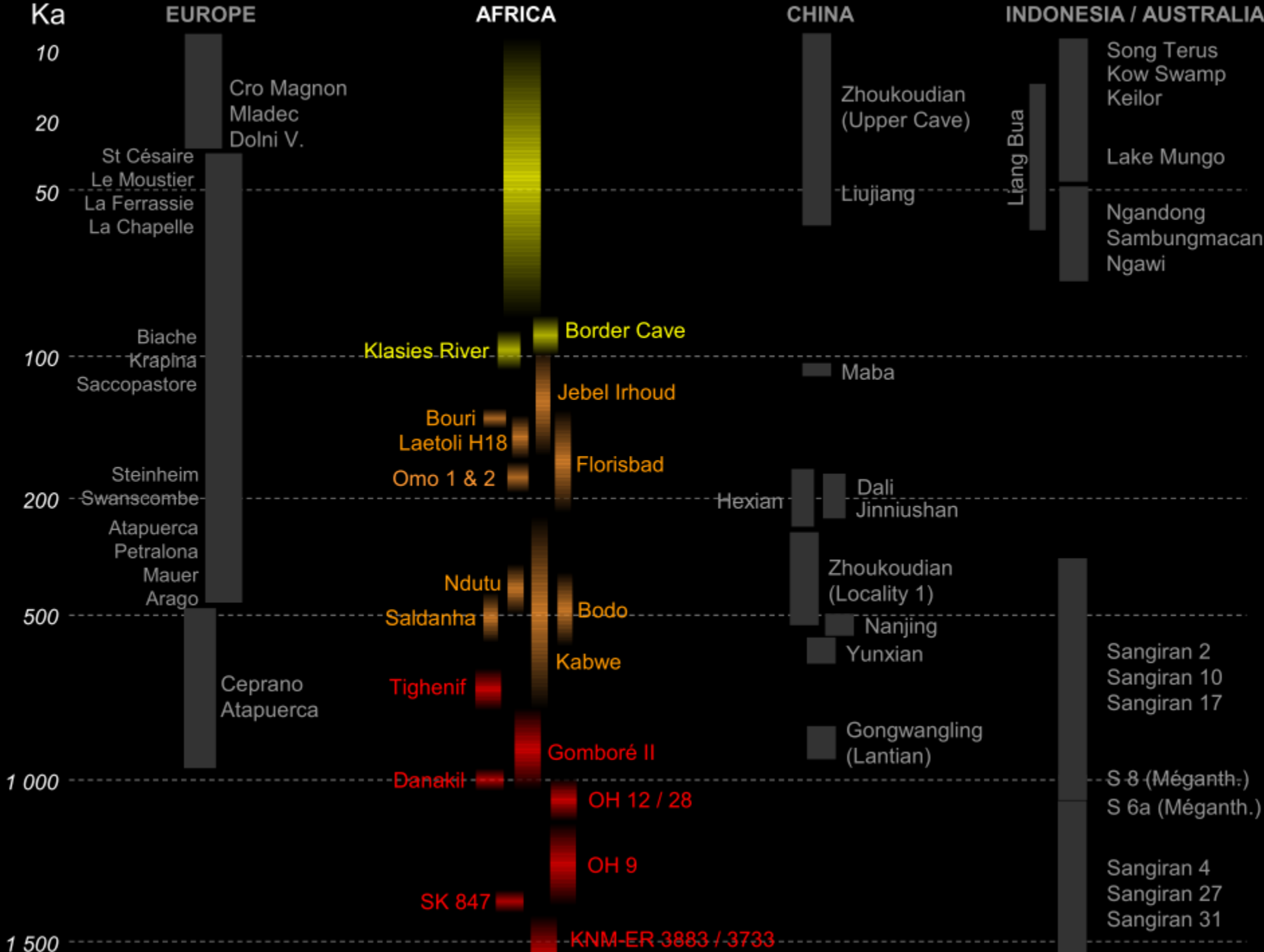
Lake Mungo	60,000-46,000
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Asia:

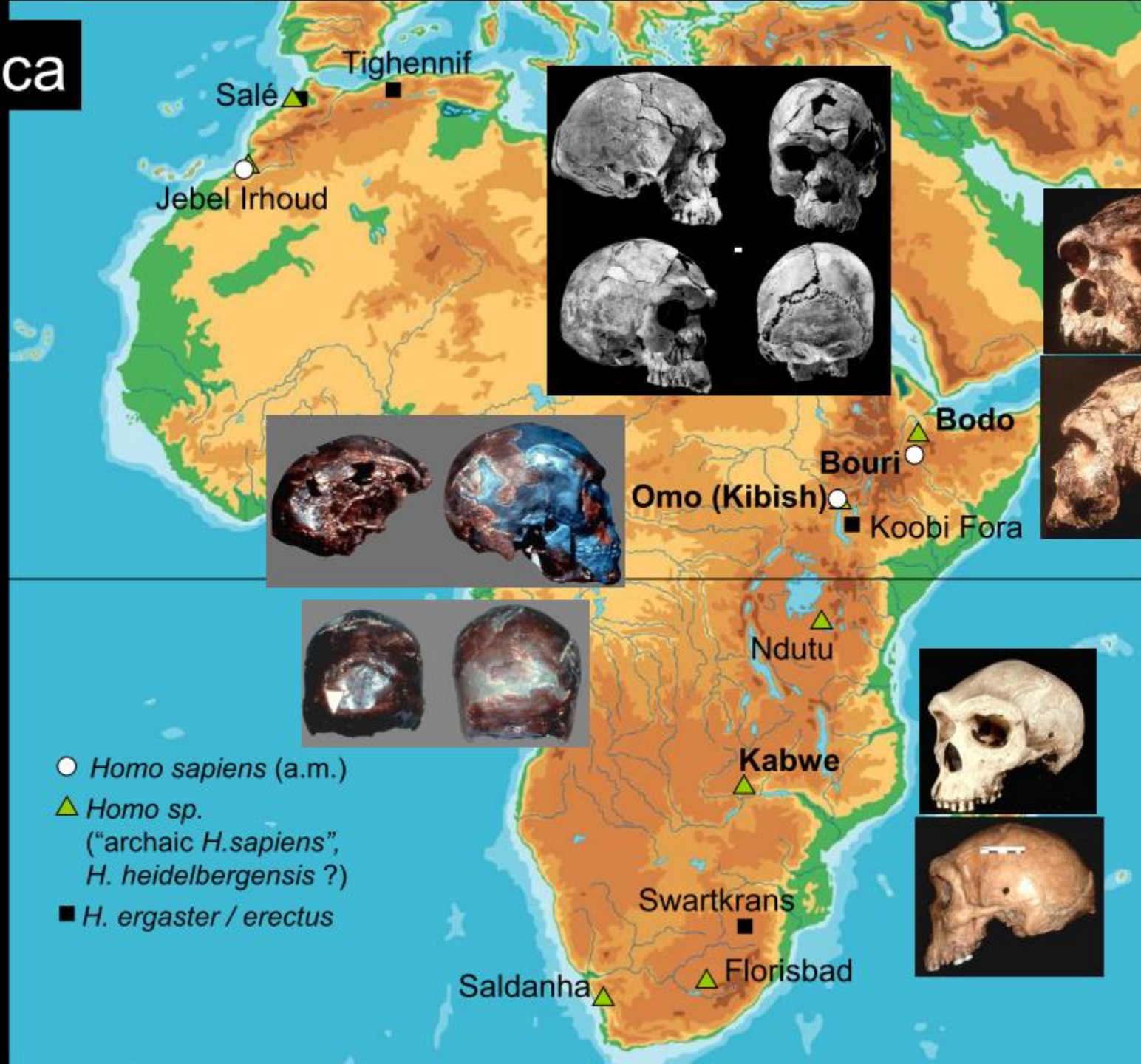
Ordos (Mongolia)	40,000-20,000 ?
Liujang (China)	139,000-111,000 ?
Zhoukoudian upper cave (China)	27,000

Europe:

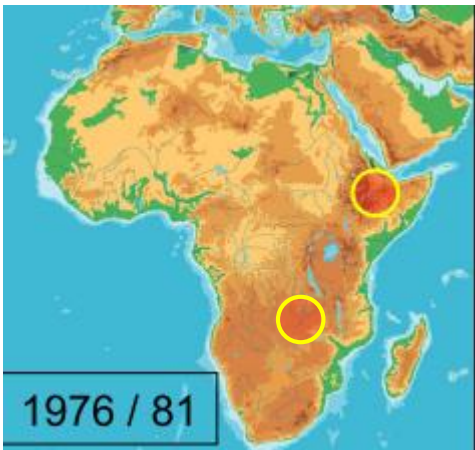
Peștera cu Oase (Romania)	36,000-34,000
Combe Capelle (France)	35,000-30,000
Mladeč and Předmostí (Czech Republic)	35,000-25,000
Cro-Magnon (France)	27,000-23,000



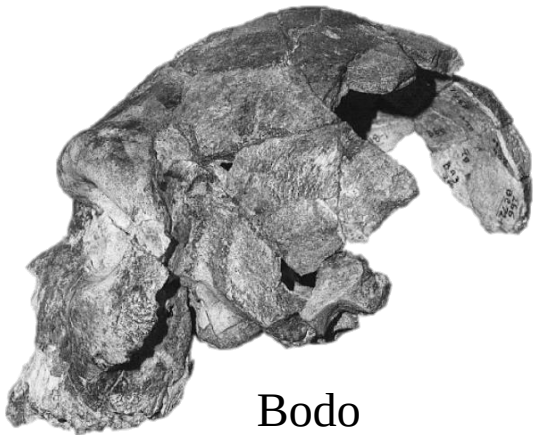
Africa



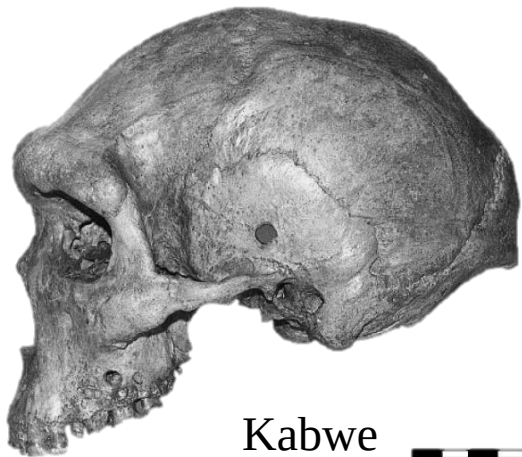
Bodo, Ethiopia and Kabwe (Broken Hill, Zambia) 600 000 y B.P.?



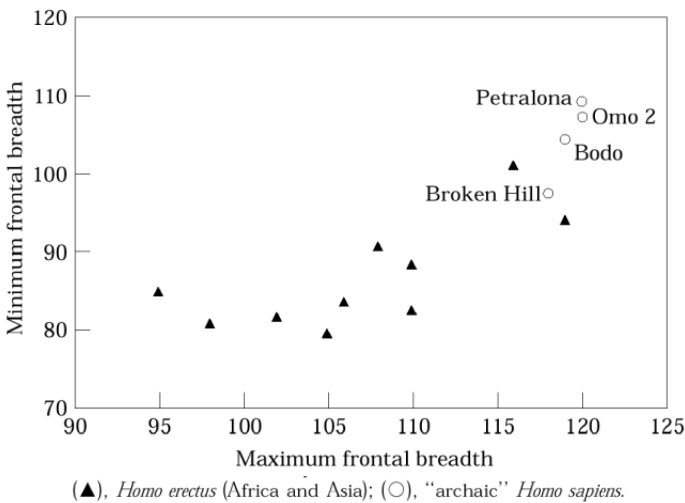
Bodo (Rightmire, 1995)



Bodo



Kabwe





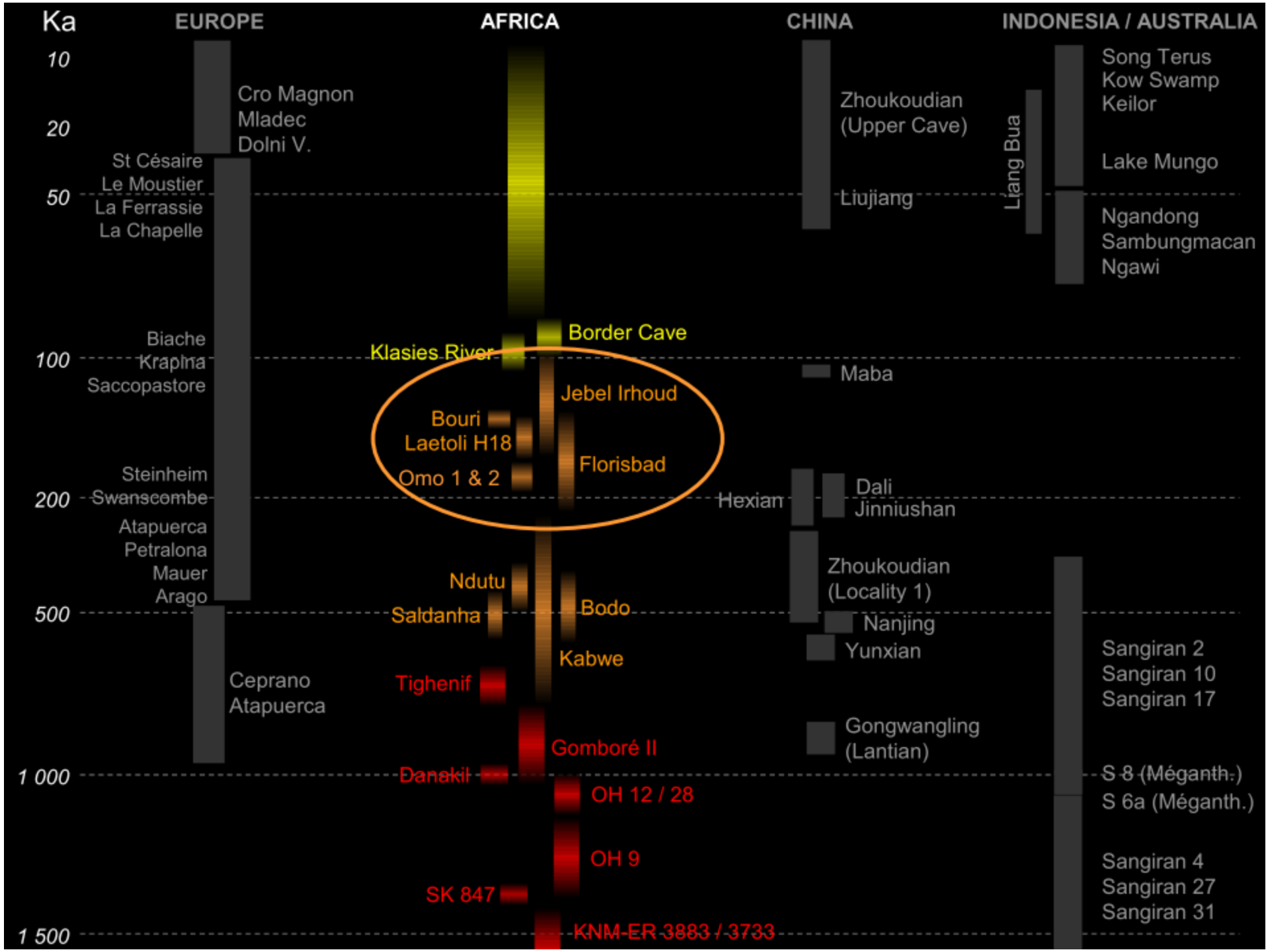
Nduvu, Tanzania
400 000 y BP

H. erectus: Dimensions of the cranium, thickness of the vault bones.



Archaic *H. sapiens*: Occipital and mastoid morphology

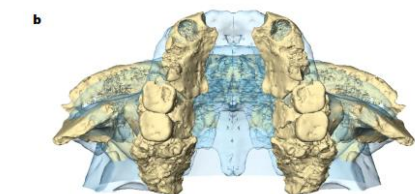
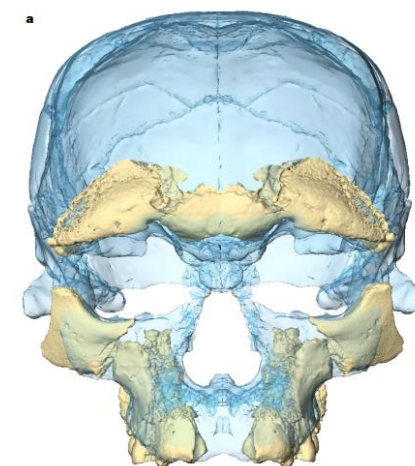
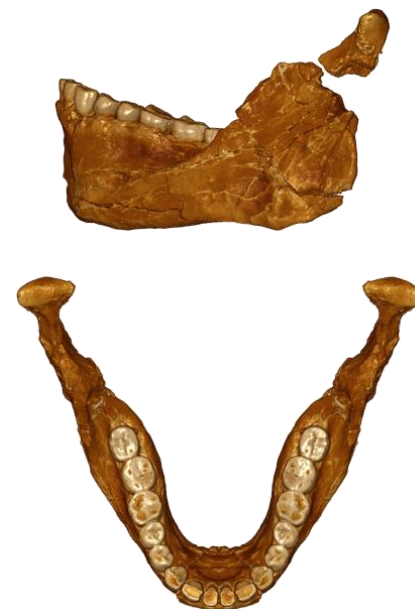
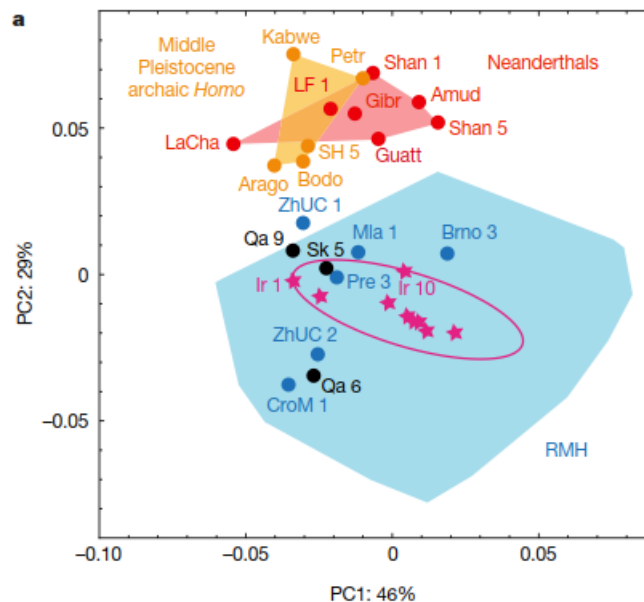




New fossils from Jebel Irhoud, Morocco and the pan-African origin of *Homo sapiens*

Jean-Jacques Hublin^{1,2}, Abdelouahed Ben-Ncer³, Shara E. Bailey⁴, Sarah E. Freidline¹, Simon Neubauer¹, Matthew M. Skinner⁵, Inga Bergmann¹, Adeline Le Cabec¹, Stefano Benazzi⁶, Katerina Harvati⁷ & Philipp Gunz¹

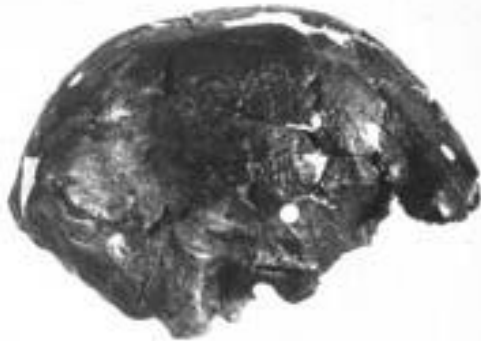
Fossil evidence points to an African origin of *Homo sapiens* from a group called either *H. heidelbergensis* or *H. rhodesiensis*. However, the exact place and time of emergence of *H. sapiens* remain obscure because the fossil record is scarce and the chronological age of many key specimens remains uncertain. In particular, it is unclear whether the present day 'modern' morphology rapidly emerged approximately 200 thousand years ago (ka) among earlier representatives of *H. sapiens*¹ or evolved gradually over the last 400 thousand years². Here we report newly discovered human fossils from Jebel Irhoud, Morocco, and interpret the affinities of the hominins from this site with other archaic and recent human groups. We identified a mosaic of features including facial, mandibular and dental morphology that aligns the Jebel Irhoud material with early or recent anatomically modern humans and more primitive neurocranial and endocranial morphology. In combination with an age of 315 ± 34 thousand years³ (as determined by thermoluminescence dating)³, this evidence makes Jebel Irhoud the oldest and richest African Middle Stone Age hominin site that documents early stages of the *H. sapiens* clade in which key features of modern morphology were established. Furthermore, it shows that the evolutionary processes behind the emergence of *H. sapiens* involved the whole African continent.



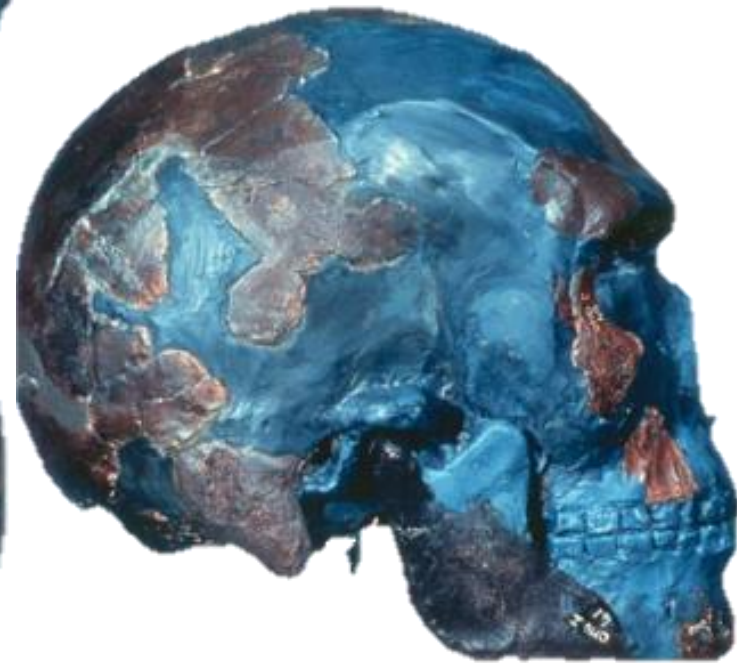
Omo Kibish, Ethiopia
195 000 - 130 000 y BP



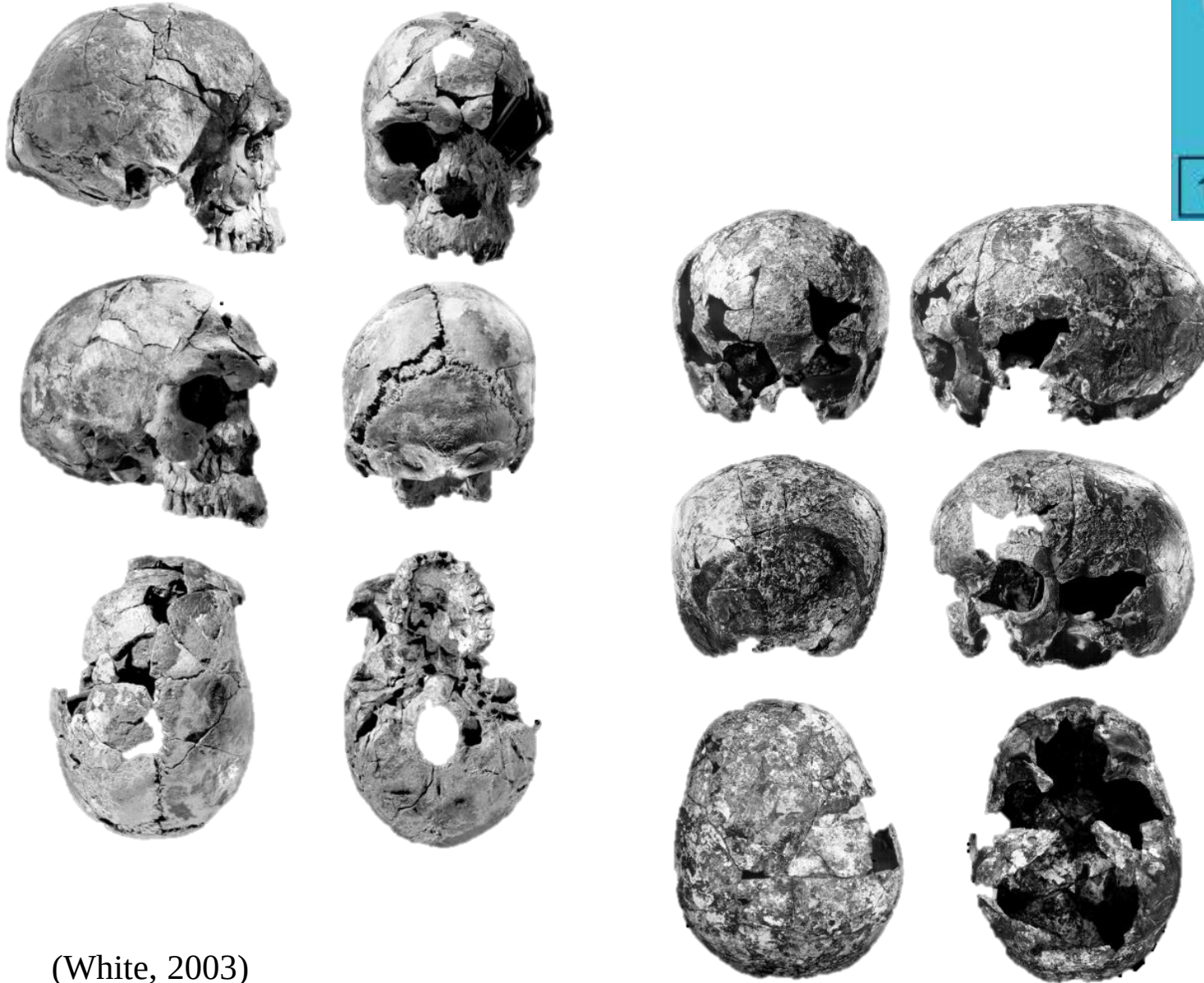
Omo 1



Omo 2



Herto Bouri, Middle Awash, Ethiopia
154-160 000 y BP



(White, 2003)

Homo sapiens idaltu

I resti sono stati scoperti per la prima volta nel sito di Herto Bouri (Etiopia) e sono datati a circa 160 ka anni BP.

The remains were discovered for the first time in the site of Herto Bouri (Ethiopia) and have been dated to 160 ka BP.



“Perché I ominidi di Herto sono morfologicamente appena sotto la variabilità dei AMHS [Anatomically Modern *Homo sapiens*] e perché sono differenti degli altri ominidi fossili conosciuti, le riconosciamo come *Homo sapiens idaltu*, una nuova paleosubspecie di *Homo sapiens*.”



Herto (Afar, Etiopia),
160.000 anni (White, 2003)

*"Because the Herto hominids are morphologically just beyond the range of variation seen in AMHS [anatomically modern *Homo sapiens*], and because they differ from all other known fossil hominids, we recognize them here as *Homo sapiens idaltu*, a new palaeosubspecies of *Homo sapiens*."*

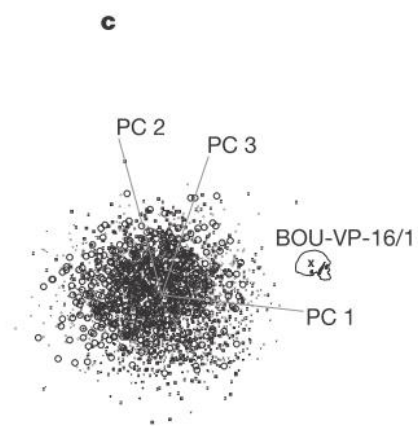
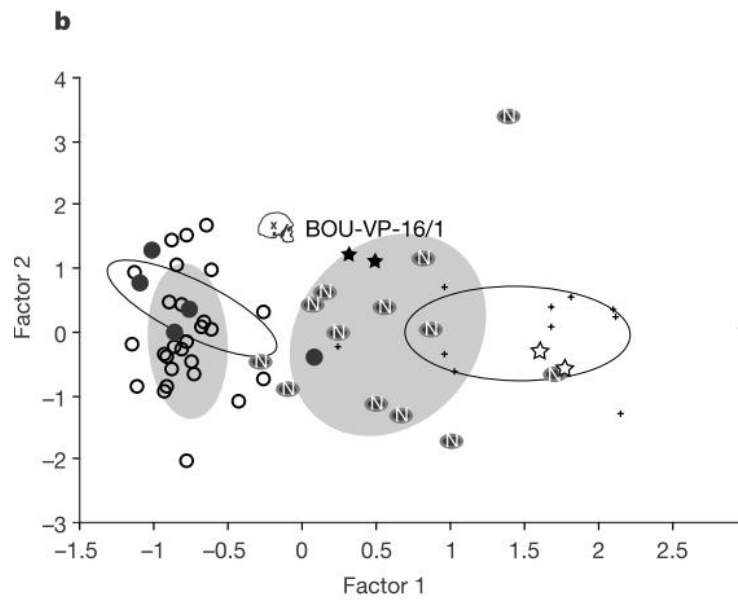
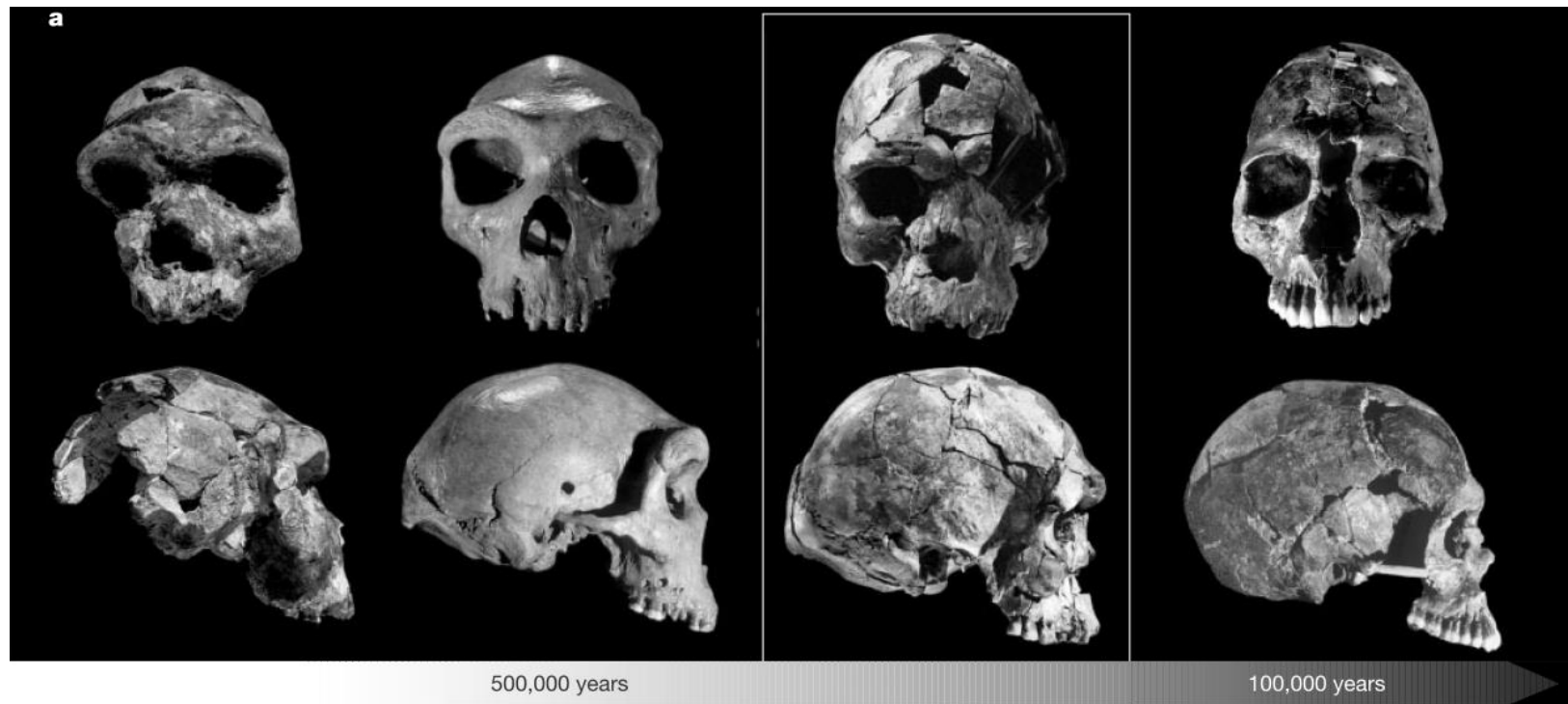
Order Primates L., 1758
Suborder Anthroidea Mivart, 1864
Superfamily Hominoidea Gray, 1825
Family Hominidae Gray, 1825
Homo sapiens idaltu subsp. nov.

Etymology. The subspecies name 'idaltu' is taken from the Afar language. It means 'elder'.
Holotype. BOU-VP-16/1 (Fig. 1), an adult cranium with partial dentition. Holotype and referred material are housed at the National Museum of Ethiopia, Addis Ababa. Holotype from Bouri Vertebrate Paleontology Locality 16 (BOU-VP 16); differentially corrected GPS coordinates: 10° 15.5484' N and 40° 33.3834' E.

Referred material. BOU-VP-16/2 cranial fragments; BOU-VP-16/3 parietal fragment; BOU-VP-16/4 parietal fragment; BOU-VP-16/5 child's cranium; BOU-VP-16/6 R. upper molar; BOU-VP-16/7 parietal fragment, BOU-VP-16/18 parietal fragments; BOU-VP-16/42 upper premolar, BOU-VP-16/43 parietal fragment.

Stratigraphy and age. Bouri Formation, Upper Herto Member. Dated by ⁴⁰Ar/³⁹Ar to between 160,000 and 154,000 years ago (ref. 6).

Diagnosis. On the limited available evidence, a subspecies of *Homo sapiens* distinguished from Holocene anatomically modern humans (*Homo sapiens sapiens*) by greater craniofacial robusticity, greater anterior–posterior cranial length, and large glenoid-to-occlusal plane distance. *Homo sapiens idaltu* is distinguished from the holotype of *Homo rhodesiensis* (Woodward, 1921) by a larger cranial capacity, a more vertical frontal with smaller face, and more marked midfacial topography (for example, canine fossa). We consider the holotypes of *H. helmei* and *H. njarasensis* too fragmentary for appropriate comparisons.



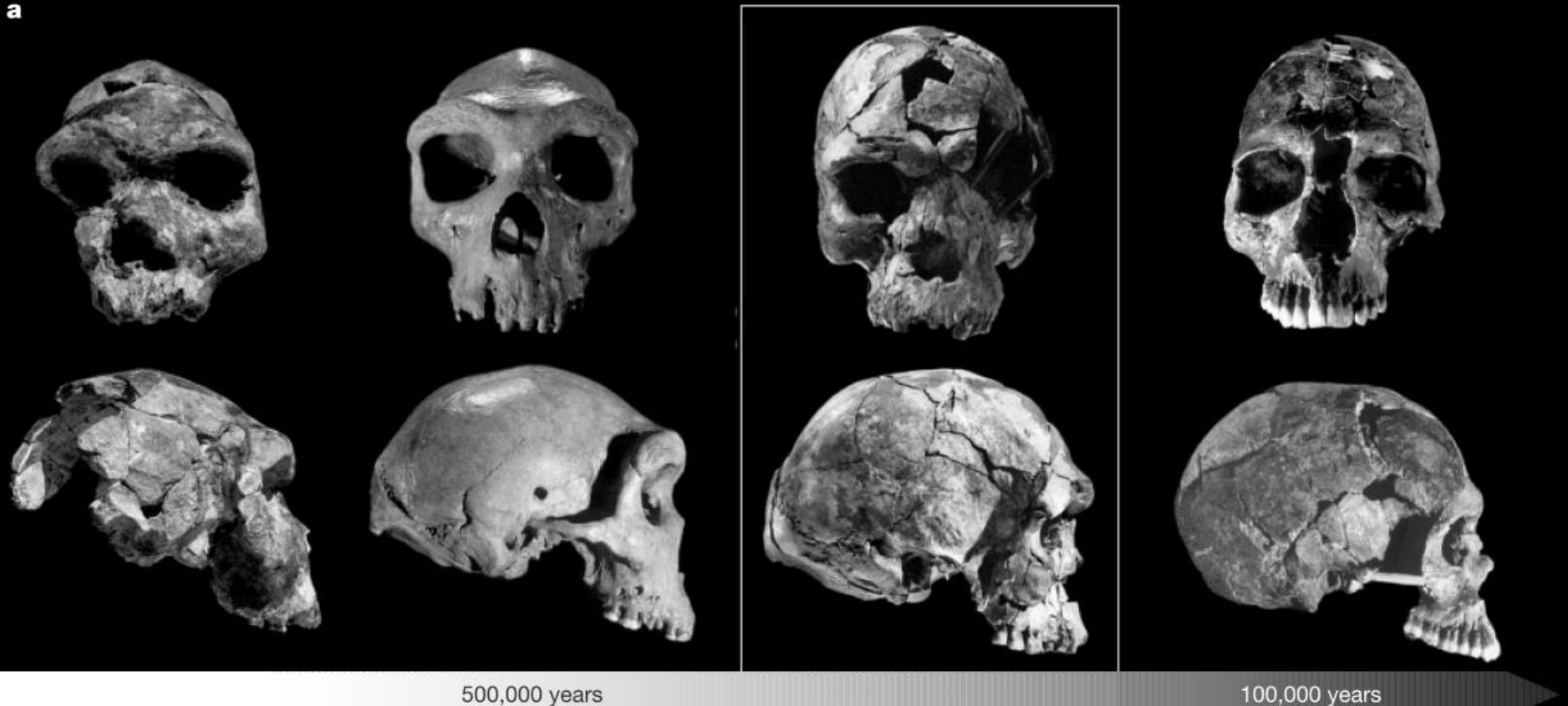
The african « evolutionary sequence » for *Homo sapiens*

Archaic *Homo sapiens*
Homo rhodesiensis?
Homo heidelbergensis?



Anat. modern
Homo sapiens

a



Near-East



- Oldest anatomically modern *Homo sapiens* outside Africa
- Oldest human burials

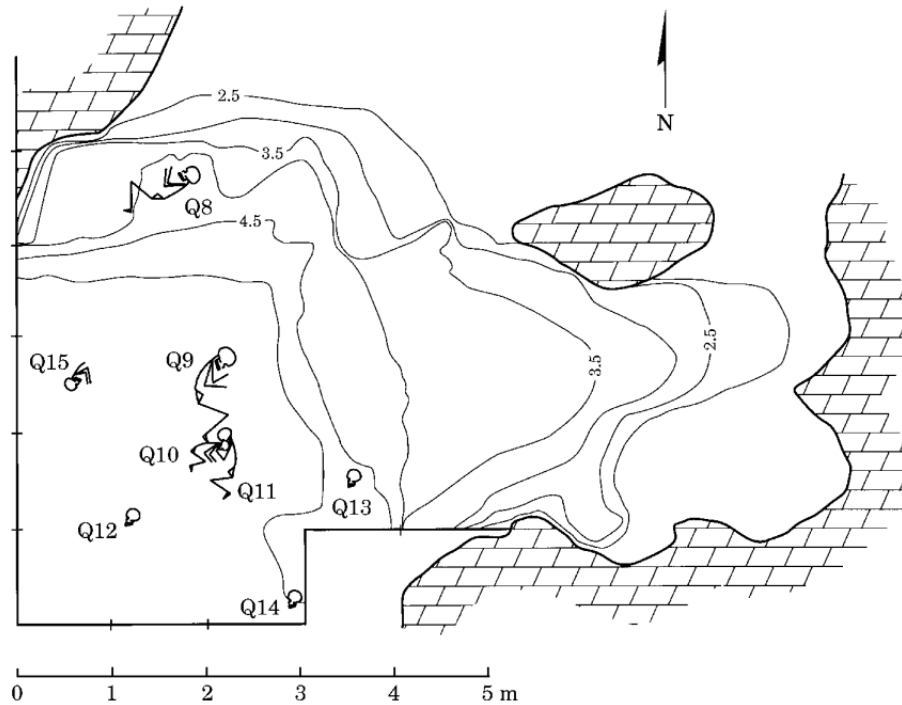
Near-East



- Oldest anatomically modern *Homo sapiens* outside Africa
- Oldest human burials

Qafzeh, Israel
90-100 000 y BP

Human remains (MNI 25 individuals)
Mousterian industries



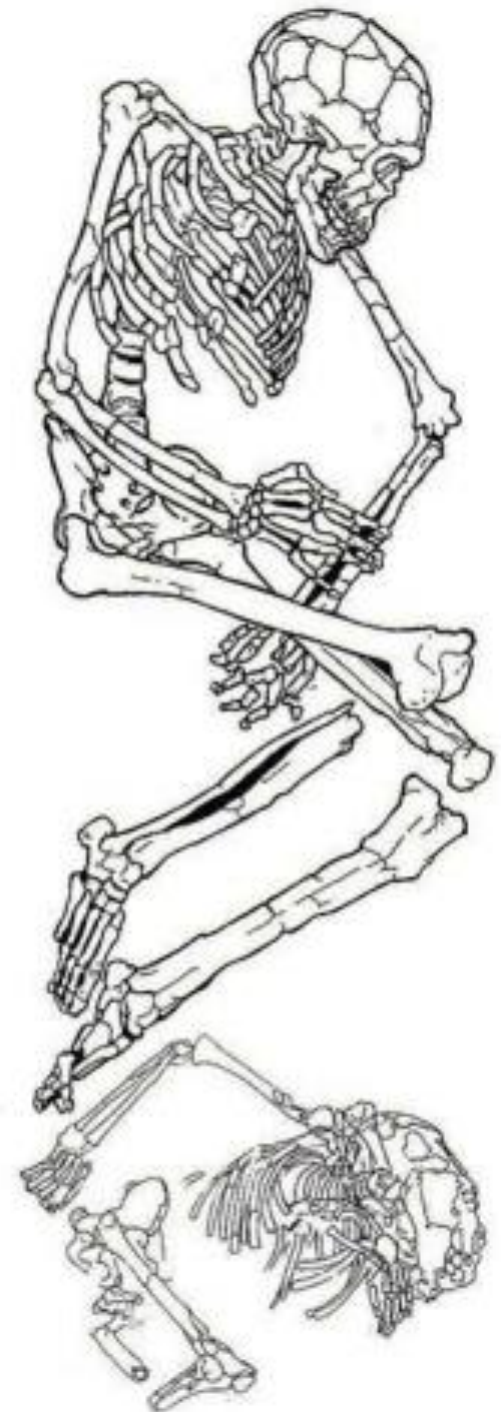
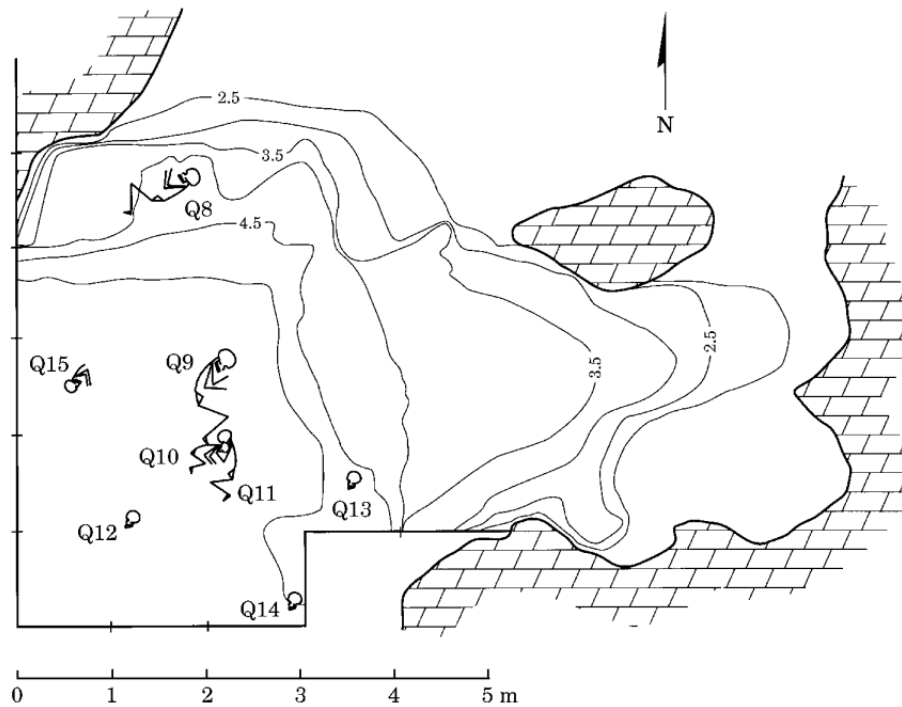
(Vandermeersch, 1981)



Qafzeh 9

Qafzeh, Israel
90-100 000 y BP

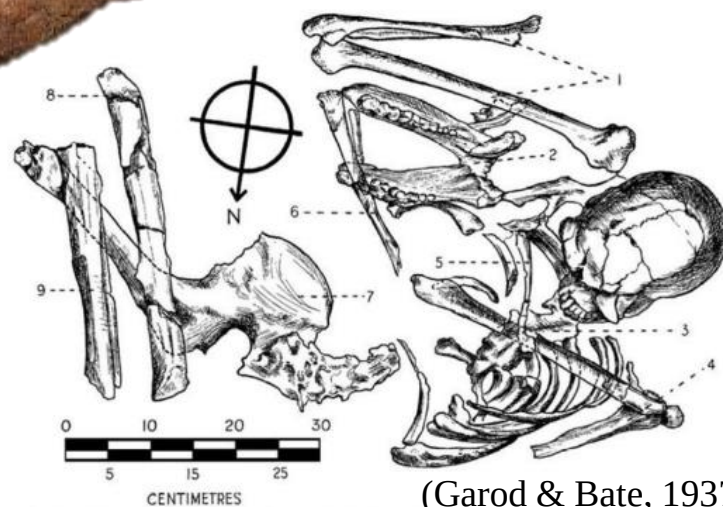
Double burial



(Vandermeersch, 1981)



Skhul V, Israel
100 000 y BP



(Garod & Bate, 1937)

2. Plan of the contracted burial of a tall male, Skhul V. 1, right arm; 2, Pig's mandible; 3, dorsal vertebrae; 4, left scapula and humerus; 5, left clavicle; 6, left radius; 7, right ilium; 8, left femur; 9, left tibia and fibula.

I primi *Homo sapiens* nel Vicino Oriente

First Homo sapiens in the Near-East

Skhul - Israele (100.000 BP)

- Industria musteriana / *Mousterian industries*
- 10 scheletri completi / *10 complete skeleton*
- morfologia arcaica (inizialmente attribuiti a *Homo neanderthalensis*) / *Archaic morphology (attributed at the beginning to Homo neanderthalensis)*



Skhul IV

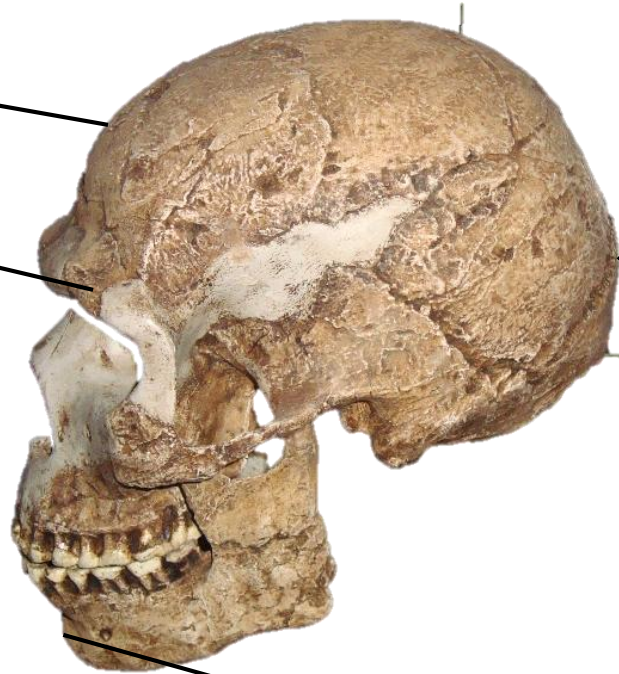
I primi *Homo sapiens* nel Vicino Oriente

First Homo sapiens in the Near-East

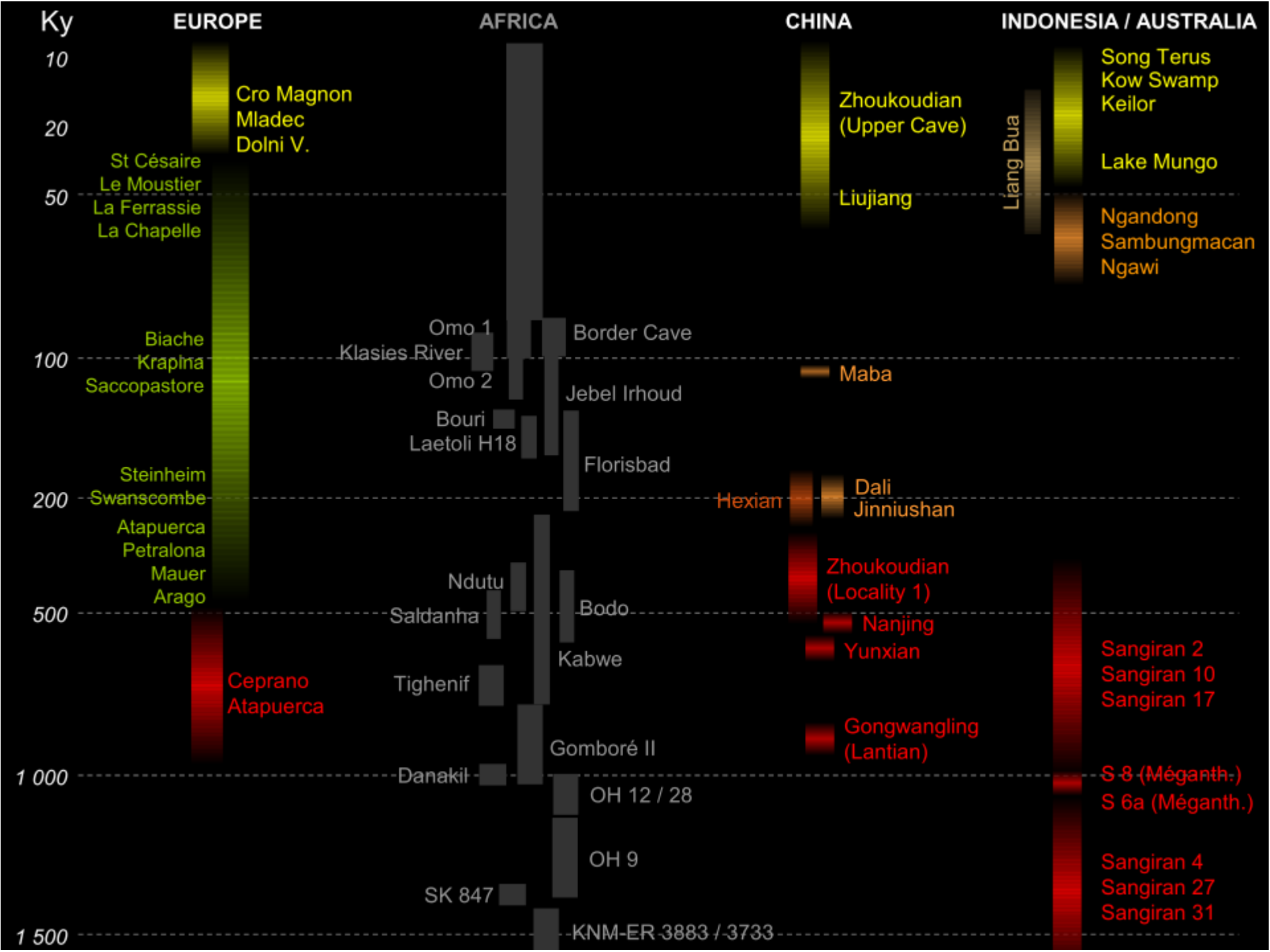
Fronte convessa /
Convexe forehead

Assenza del toro sopra
orbitario /
Lack of supra-orbital torus

Occipitale arrotondato /
Rounded occipital



Mento / *Chin*



Fossil record

Homo erectus

East Asia (China)

Southeast Asia

mainland

insular (Java)

H. erectus /archaic *H. sapiens*

East Asia (China)

Southeast Asia

insular (Java)

fossil *Homo sapiens*

East Asia

Southeast Asia

Australia

Pacific

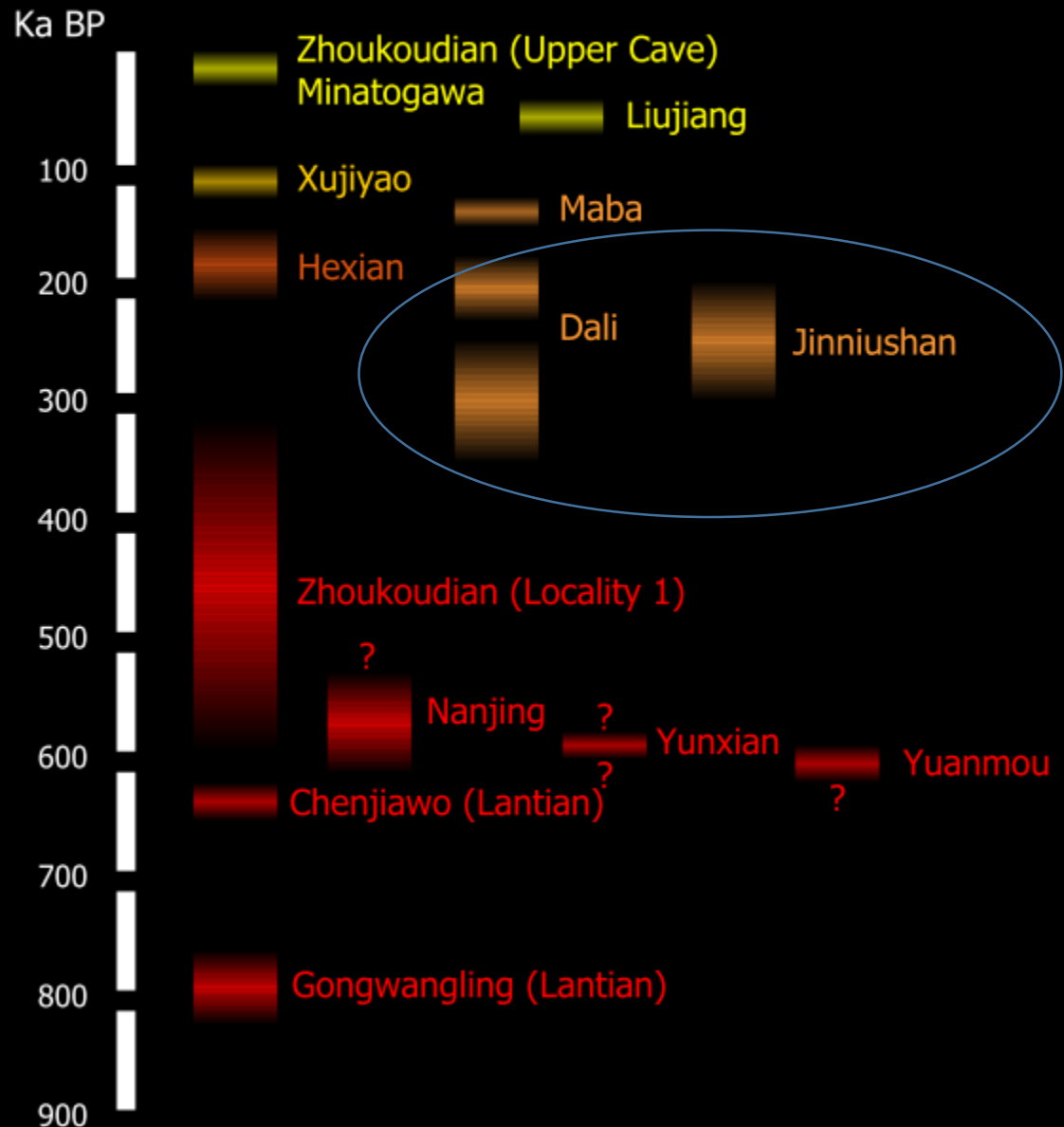


Chronology of Chinese human fossils

Anatomically modern
Homo sapiens

“Archaic” *Homo sapiens*
transition forms?

Homo erectus



South Asia: India, Narmada valley

Middle Pleistocene

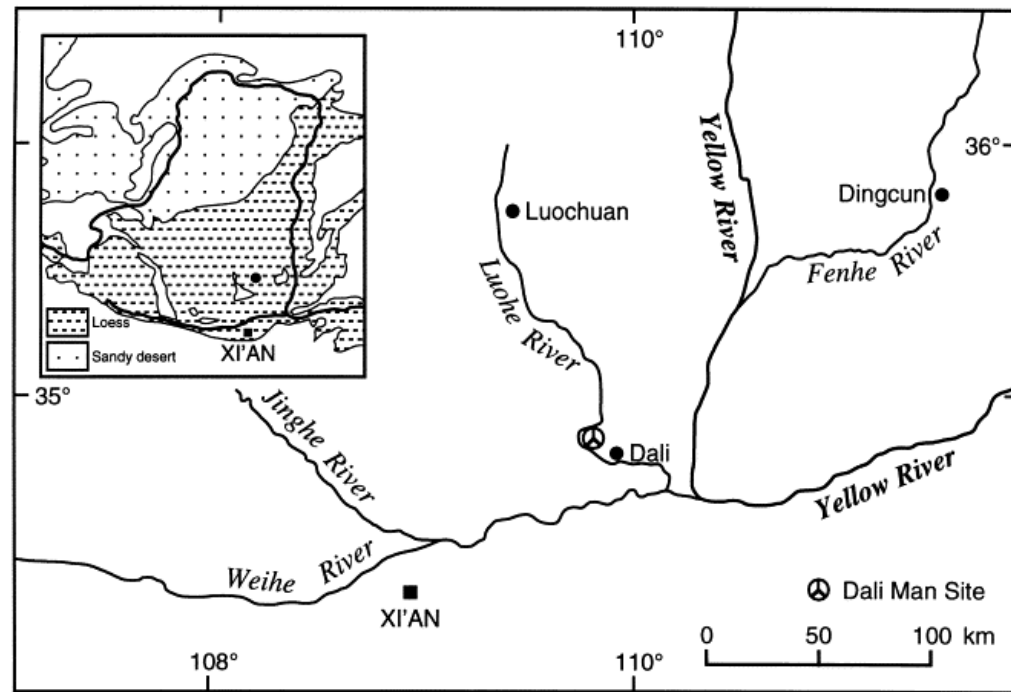
(U series from a Bovid scapula:
Minimal age ~ 236 000 y ?)



Dali, China

180 – 230 ky BP (U-Th on tooth)

250-350 ky BP (ESR – U-Th on tooth)



Mosaic of *H. erectus* and *H. sapiens* features
« archaic » *H. sapiens* = *H. rhodesiensis*, *H. heidelbergensis*?

Jinniushan, China
260 000 y B.P.



(Rosenberg et al., 2006)



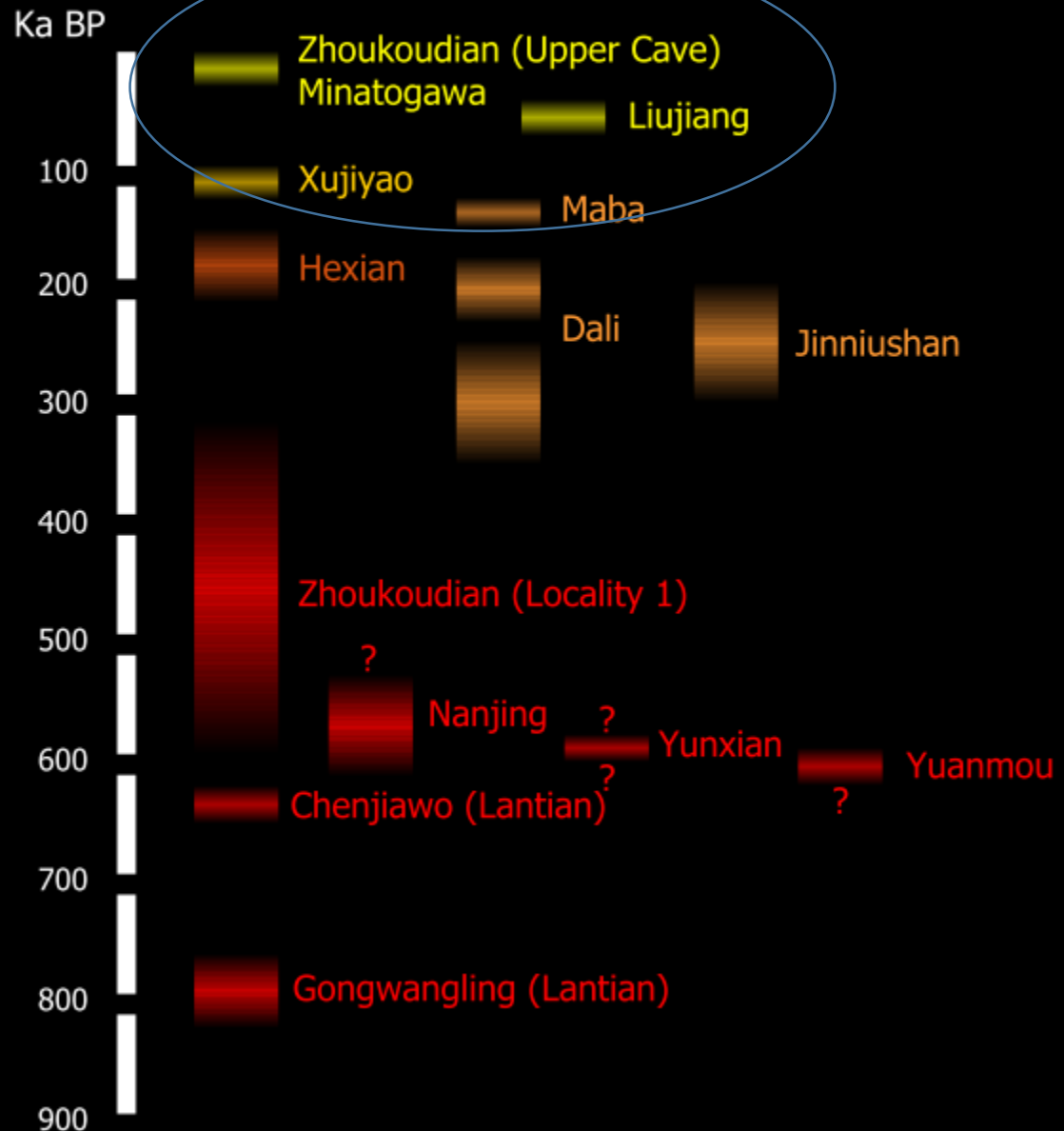
« archaic » *H. sapiens* = *Homo rhodesiensis* / *Homo heidelbergensis*?

Chronology of Chinese human fossils

Anatomically modern
Homo sapiens

“Archaic” *Homo sapiens*
transition forms?

Homo erectus



The earliest unequivocally modern humans in southern China

Wu Liu^{1*}, María Martínón-Torres^{2,3,4*}, Yan-jun Cai⁵, Song Xing¹, Hao-wen Tong¹, Shu-wen Pei¹, Mark Jan Sier^{4,6,7}, Xiao-hong Wu⁸, R. Lawrence Edwards⁹, Hai Cheng¹⁰, Yi-yuan Li¹¹, Xiong-xin Yang¹², José María Bermúdez de Castro^{2,4} & Xiu-jie Wu^{1*}

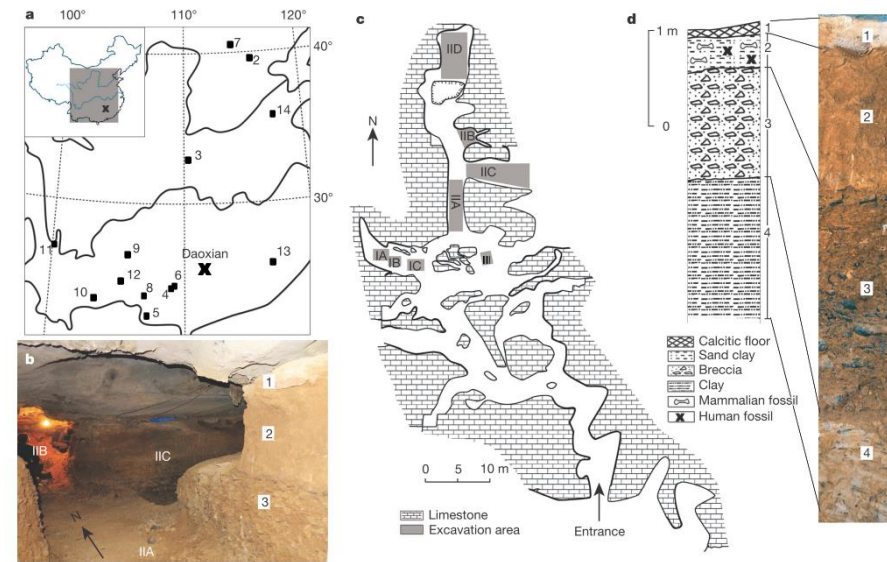
Fuyan Cave in Daoxian

47 denti umane

80 – 120 000 y BP

Più derivati che tutti i altri umani anatomicamente moderni, similarietà con il umani del Pleistocene medio, superiore e anche di tempi moderni.

“I risultati sono rilevanti per l’indagine sulle ragioni della relativamente tardiva entrata di *H. sapiens* in Europa. Degli umani moderni “completi” erano già presenti in Cina almeno 80.000 anni fa, non ci sono però evidenze dell’entrata in Europa prima di 45.000 anni fa. Questo potrebbe indicare che *H. neanderthalensis* fosse stato un’ulteriore **barriera ecologica** per gli uomini moderni, che sono potuti entrare in Europa solo quando la scomparsa dei Neanderthals era già iniziata”.



The earliest unequivocally modern humans in southern China

Wu Liu^{1*}, Maria Martínón-Torres^{2,3,4*}, Yan-jun Cai⁵, Song Xing¹, Hao-wen Tong¹, Shu-wen Pei¹, Mark Jan Sier^{4,6,7}, Xiao-hong Wu⁸, R. Lawrence Edwards⁹, Hai Cheng¹⁰, Yi-yuan Li¹¹, Xiong-xin Yang¹², José María Bermúdez de Castro^{2,4} & Xiu-jie Wu^{1*}

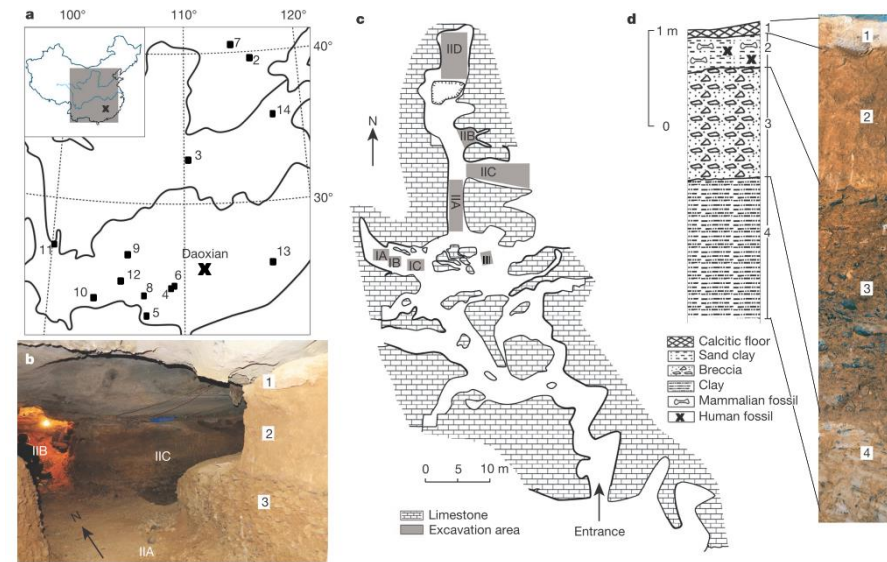
Fuyan Cave in Daoxian

47 human teeth

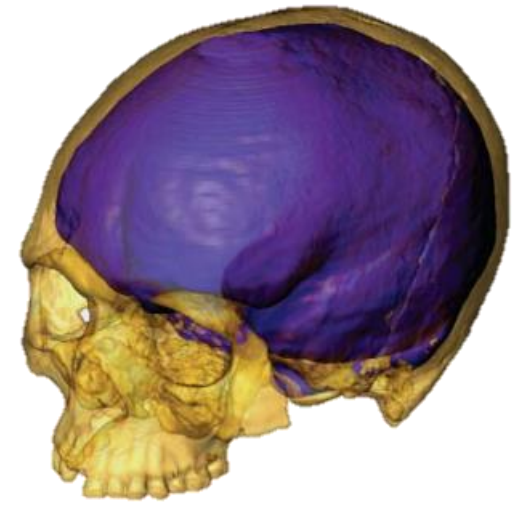
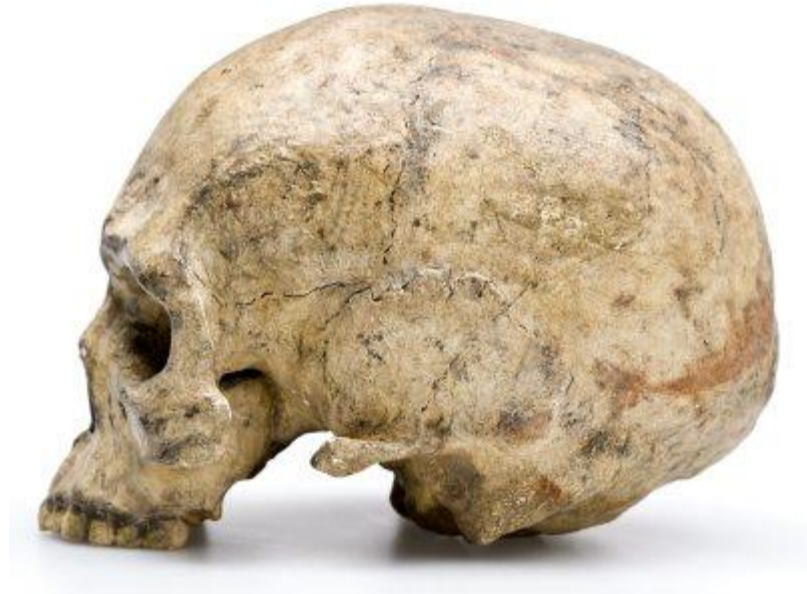
80 – 120 000 y BP

More derived than any other anatomically modern human, similarity with middle to late Late Pleistocene and contemporary humans.

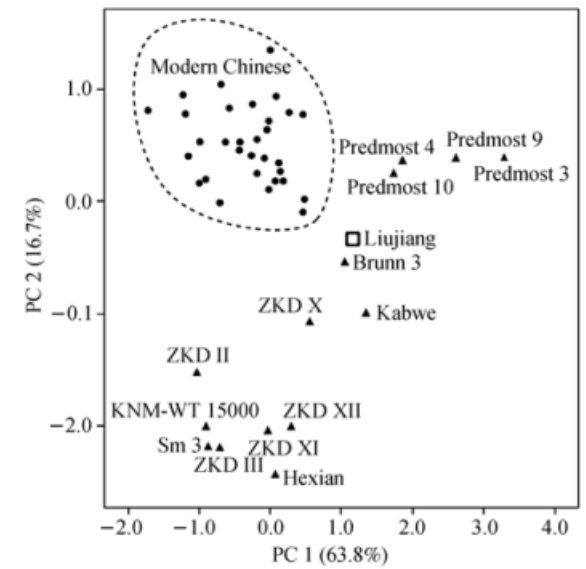
“our results are relevant to exploring the reasons for the relatively late entry of *H. sapiens* into Europe. Fully modern humans were already present in southern China at least as early as 80,000 years ago, there is no evidence that they entered Europe before 45,000 years ago. This could indicate that *H. neanderthalensis* was indeed an **additional ecological barrier** for modern humans, who could only enter Europe when the demise of Neanderthals had already started.”



Liujiang, China
60 – 100 000 y BP?



(Wu et al., 2008)



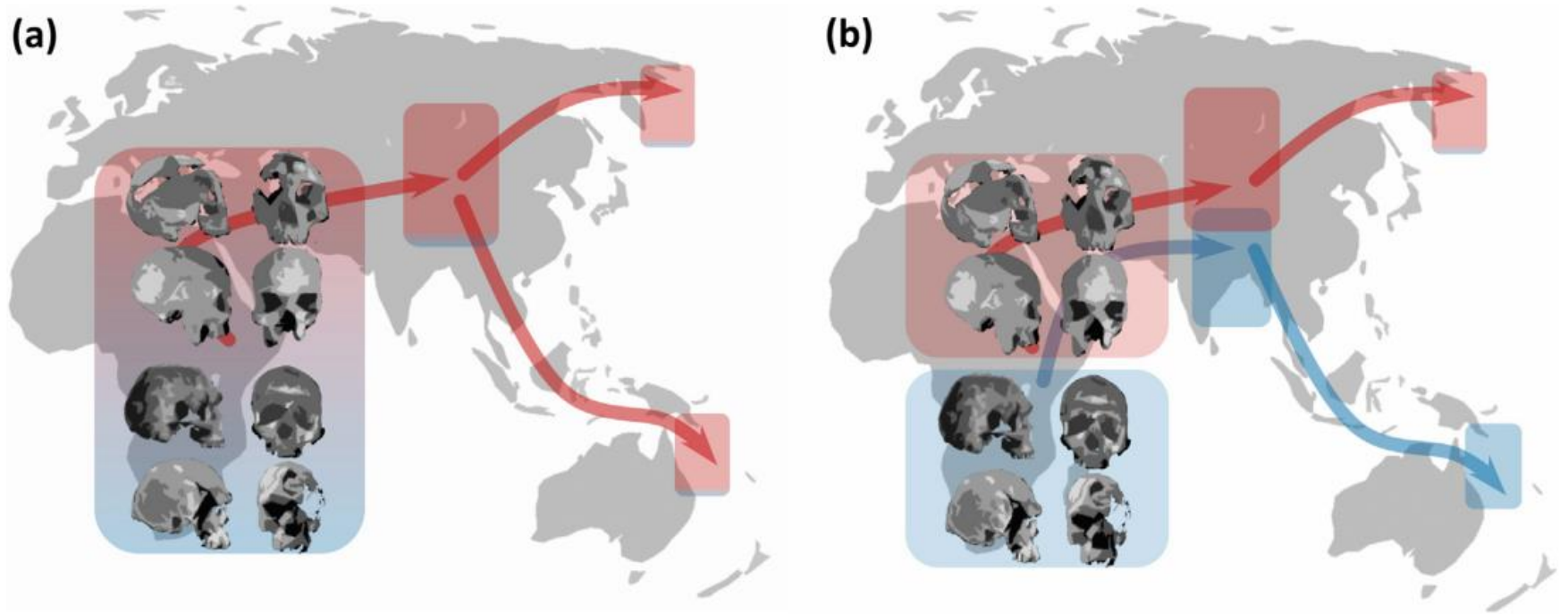
Zhoukoudian Upper Cave, China
20 – 30 000 y BP





Toward Southeast Asia and Australia





(Reyes-Centeno et al., 2014)

2 scenarios:

- a) Single dispersal
- b) Multiple dispersal

MD



MDI



(Reyes-Centeno et al., 2014)

2 scenarios:

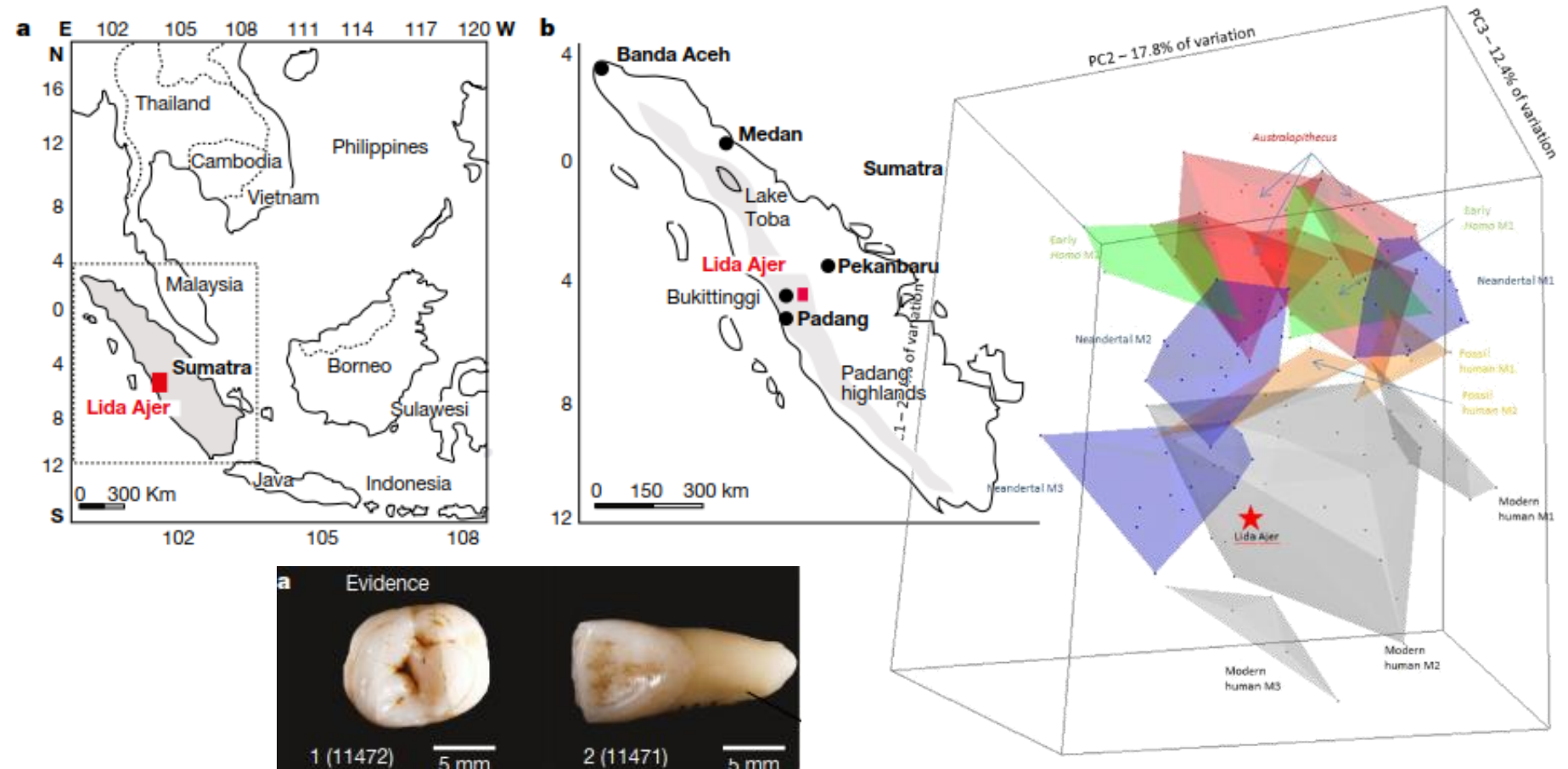
- a) Single dispersal
- b) Multiple dispersal

Recent genetic studies and accumulating archaeological and paleontological evidence suggest a « southern route » dispersal into Asia in the late Middle Pleistocene, followed by a separate dispersal into northern Eurasia.

Australo-Melanesian populations are descendants of an early dispersal whereas other Asian populations are descended from, or highly admixed with, members of a subsequent migration event.

An early modern human presence in Sumatra 73,000–63,000 years ago

K. E. Westaway¹, J. Louys², R. Due Awe^{3,†}, M. J. Morwood^{4,†}, G. J. Price⁵, J.-x. Zhao⁵, M. Aubert⁶, R. Joannes-Boyau⁷, T. M. Smith^{8,9}, M. M. Skinner^{10,11}, T. Compton¹², R. M. Bailey¹³, G. D. van den Bergh⁴, J. de Vos¹⁴, A. W. G. Pike¹⁵, C. Stringer¹², E. W. Saptomo³, Y. Rizal¹⁶, J. Zaim¹⁶, W. D. Santoso¹⁶, A. Trihascaryo¹⁶, L. Kinsley¹⁷ & B. Sulistyanto³



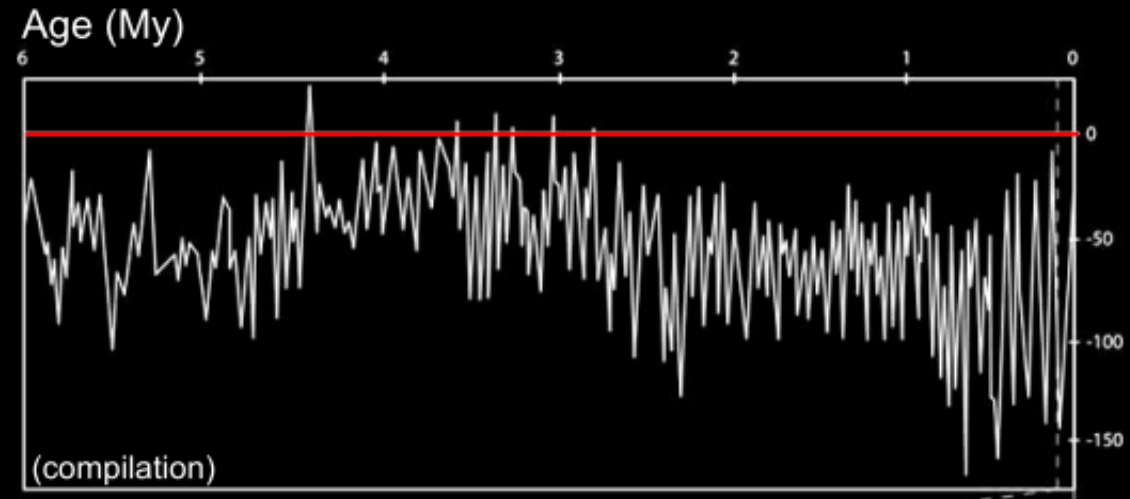
How did they arrive ?

Homo erectus

Glacial / interglacial

=> Sea level changes

- insular periods



How did they arrive ?

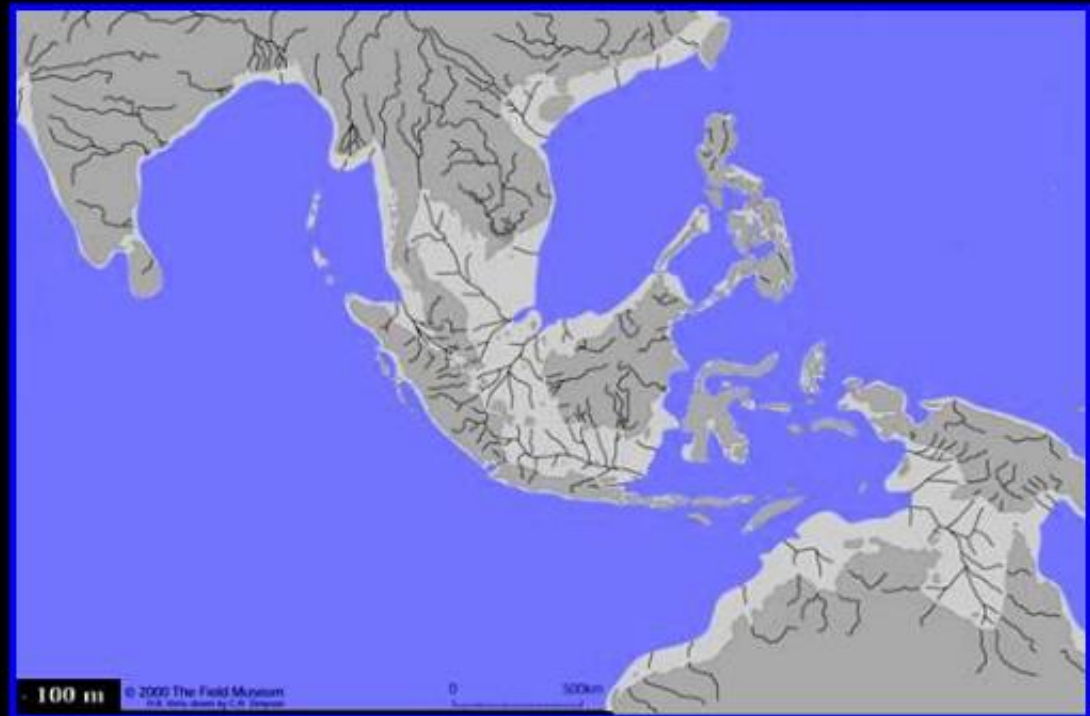
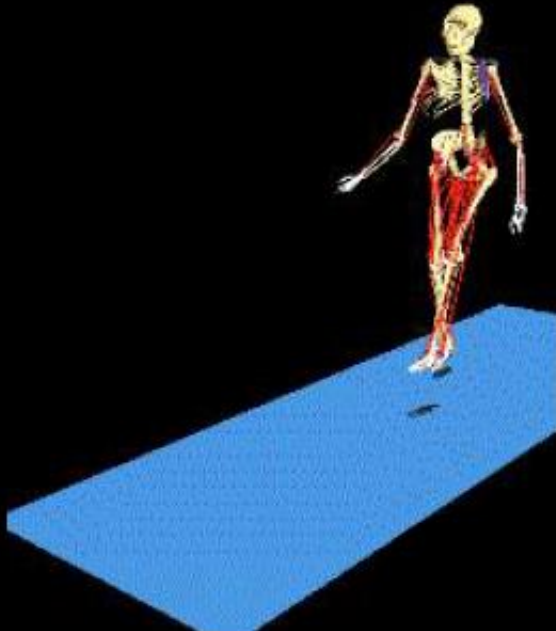
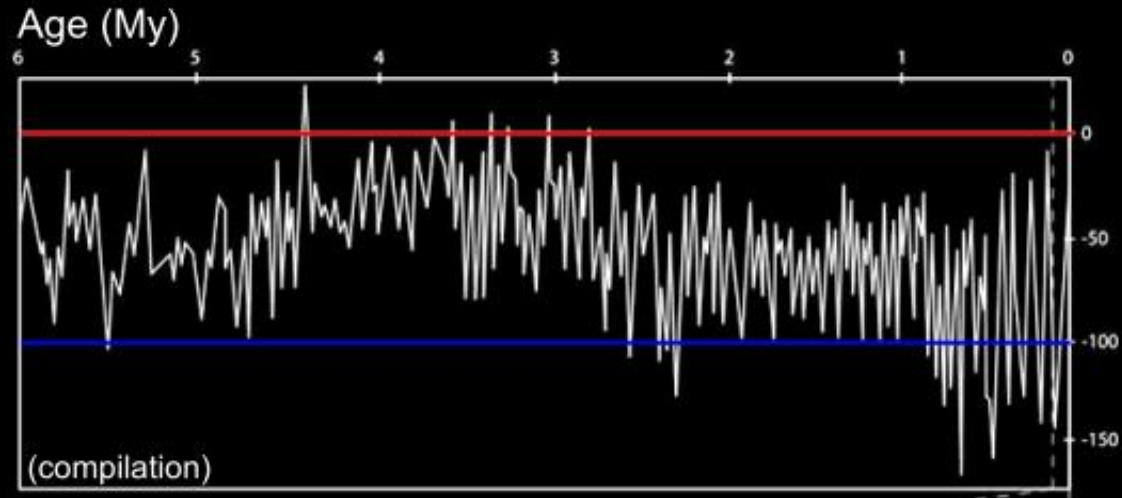
Glacial / interglacial

=> Sea level changes

- insular periods

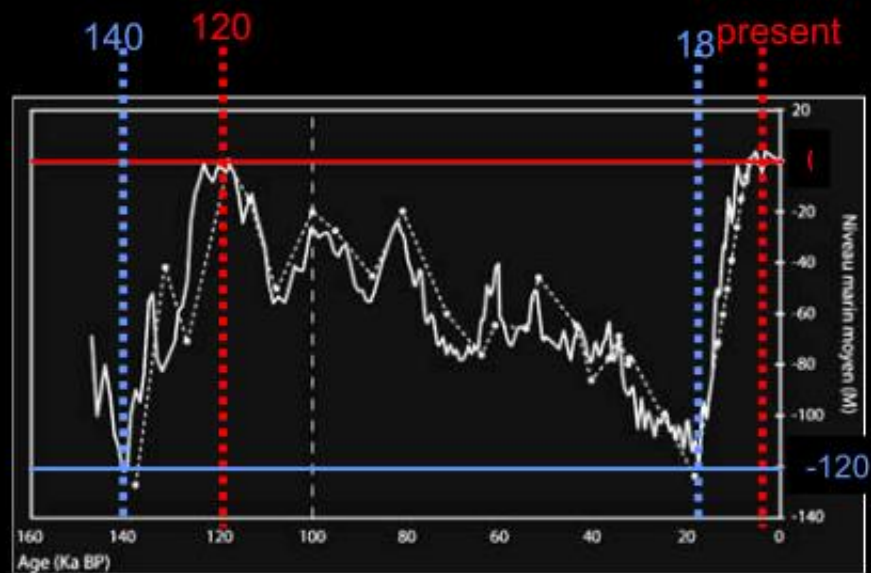
- continental periods

Homo erectus



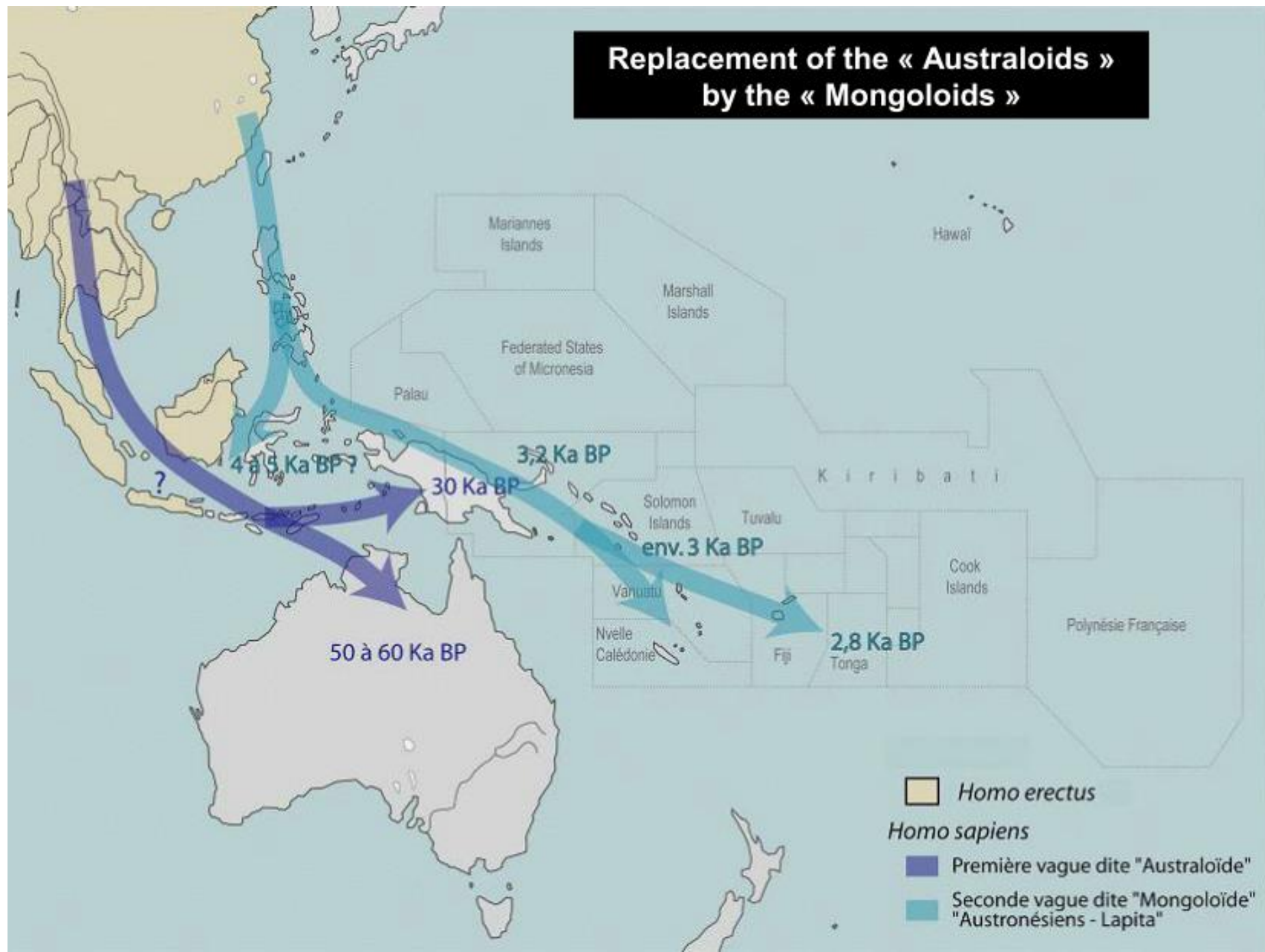
(Worris, 2000)

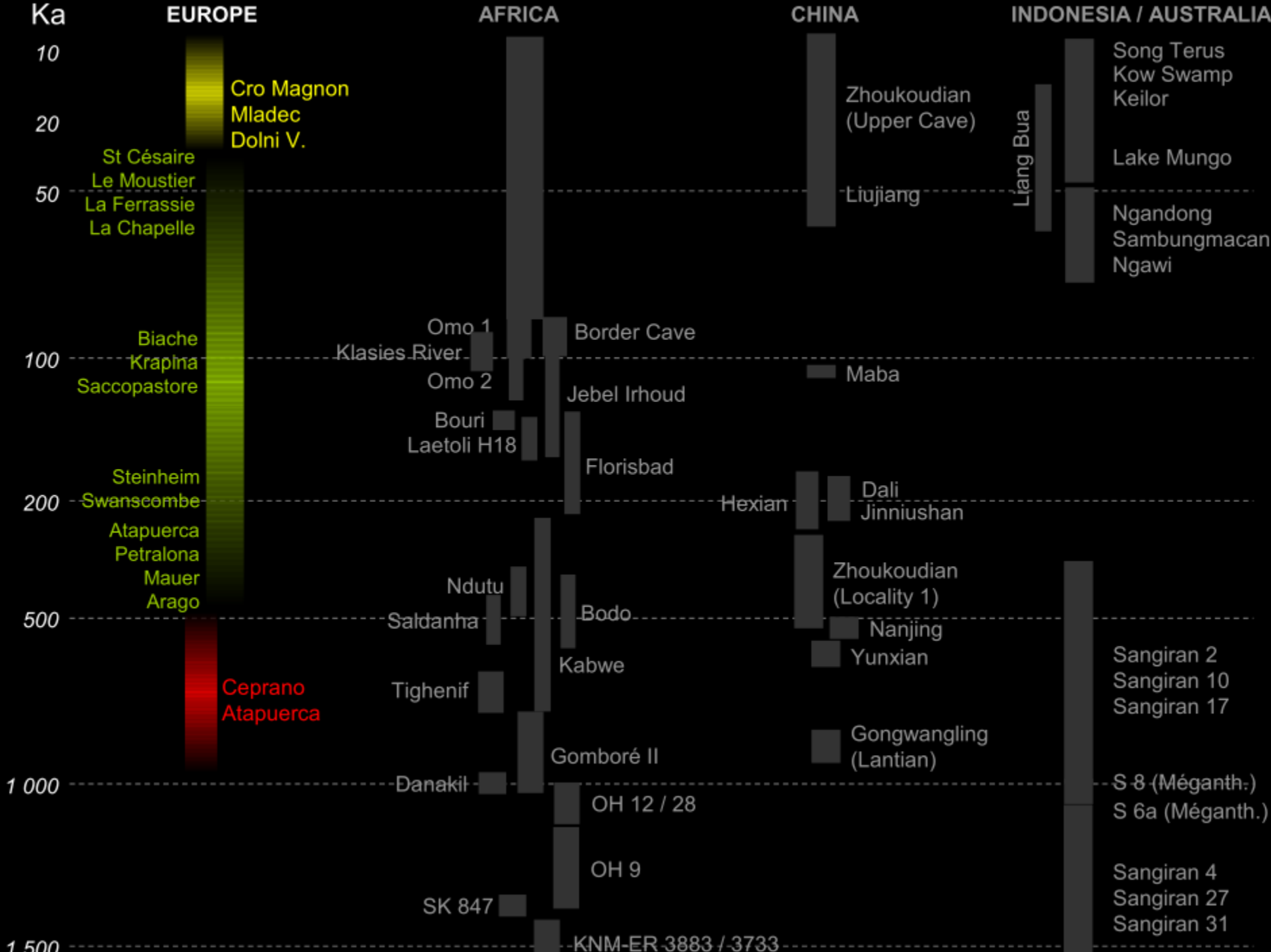
Homo sapiens is able to navigate for at least 60 000 years



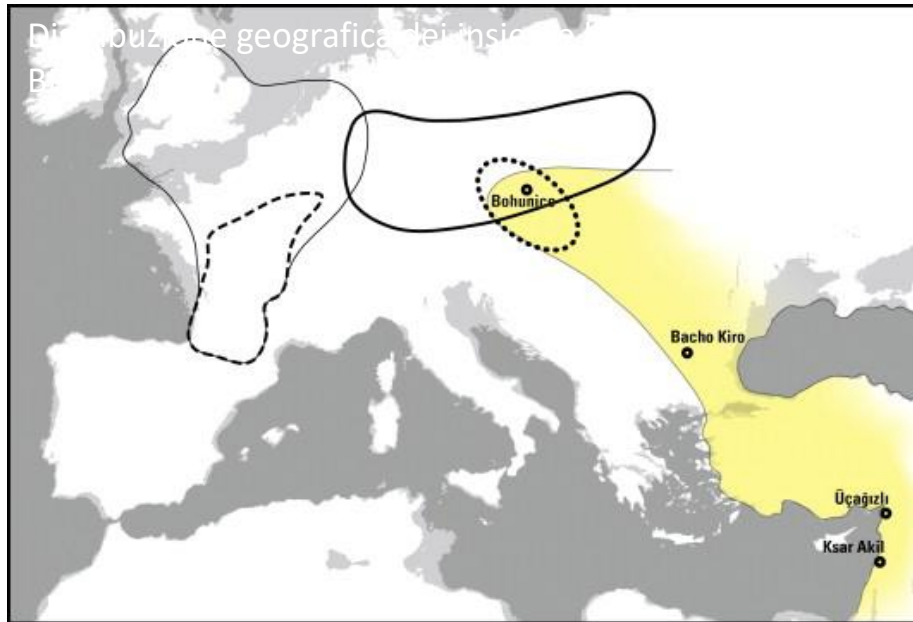
d'après Chappell *et al.* (1996) ; Pillans *et al.* (1998) et Voris (2002)

Replacement of the « Australoids » by the « Mongoloids »





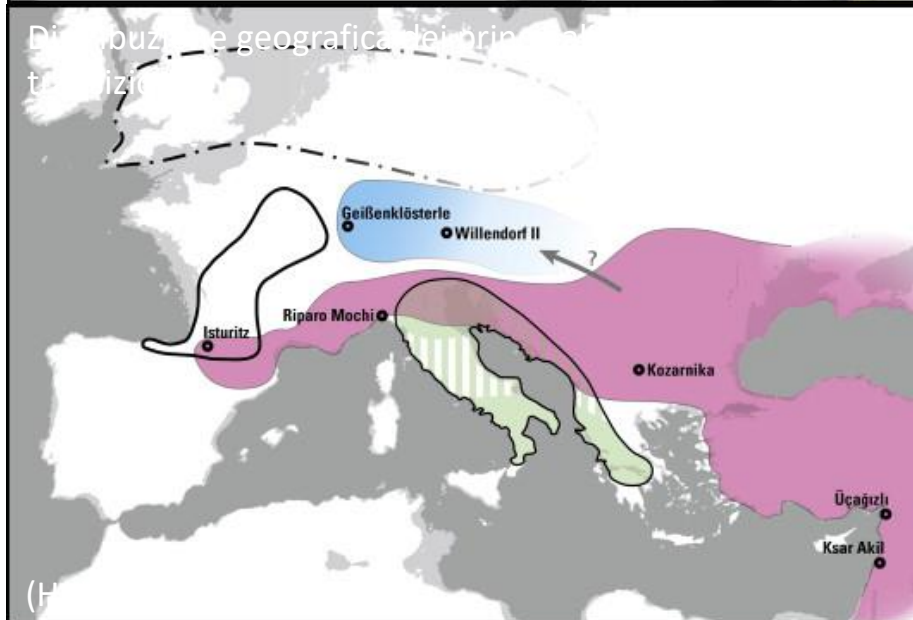
I primi uomini moderni in Europa



Bacho Kiro (Bulgaria) (Aurignaziano antico),
43.000 anni

Grotta del Cavallo (Italia) (Uluzziano),
45.000-43.000 anni

El Castillo (Spagna) (Aurignaziano antico)
37.000- 34.000 anni



Mladec (Repubblica Ceca) (32.000 anni)

Dolni Vestonice, Pavlov (Repubblica Ceca)
(25.000 anni)

Cro Magnon (Francia) (30.000 anni)

Pestera cu Oase (Grotta degli orsi, Romania)
34-36.000 anni

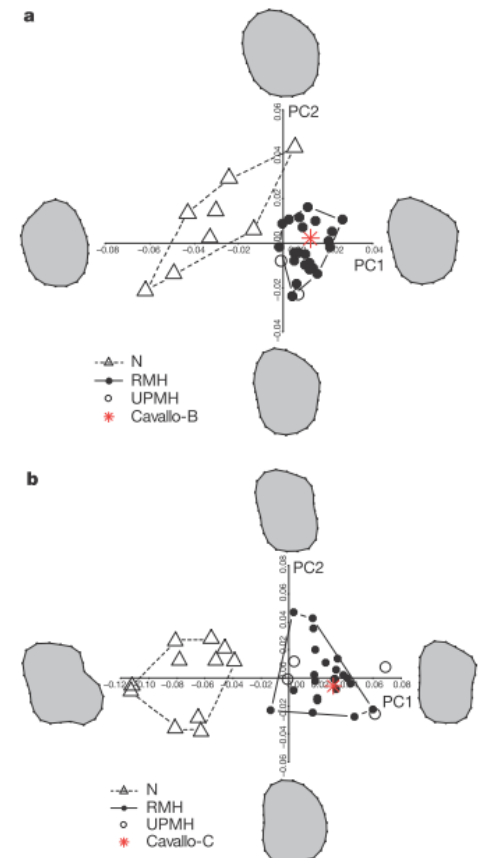
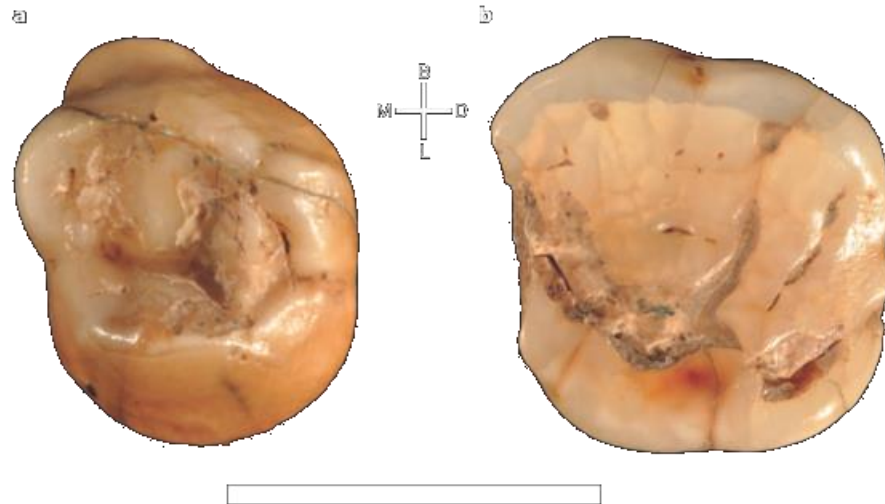


LETTER

doi:10.1038/nature10617

Early dispersal of modern humans in Europe and implications for Neanderthal behaviour

Stefano Benazzi¹, Katerina Douka², Cinzia Fornai¹, Catherine C. Bauer³, Ottmar Kullmer⁴, Jiří Svoboda^{5,6}, Ildikó Pap⁷, Francesco Mallegni⁸, Priscilla Bayle⁹, Michael Coquerelle¹⁰, Silvana Condemi¹¹, Annamaria Ronchitelli¹², Katerina Harvati³ & Gerhard W. Weber¹



Cro-Magnon, Francia

27 680 +/- 270 BP (Henry-Gambier et al, 2002)



Cro-Magnon 1



Cro-Magnon 2



Parietali espansi e
occipitale
arrotondato /
*Parietals
expanded and
rounded
occipitals*

Fronte verticale /
*Vertical frontal
bone*

Fossa canina evidente
/
Evident canine fossa

Faccia piccola e
piatta / *Short and flat
face*

H. sapiens, Cro-Magnon



Mladec V, Czech Republic
34-35 000 y BP?

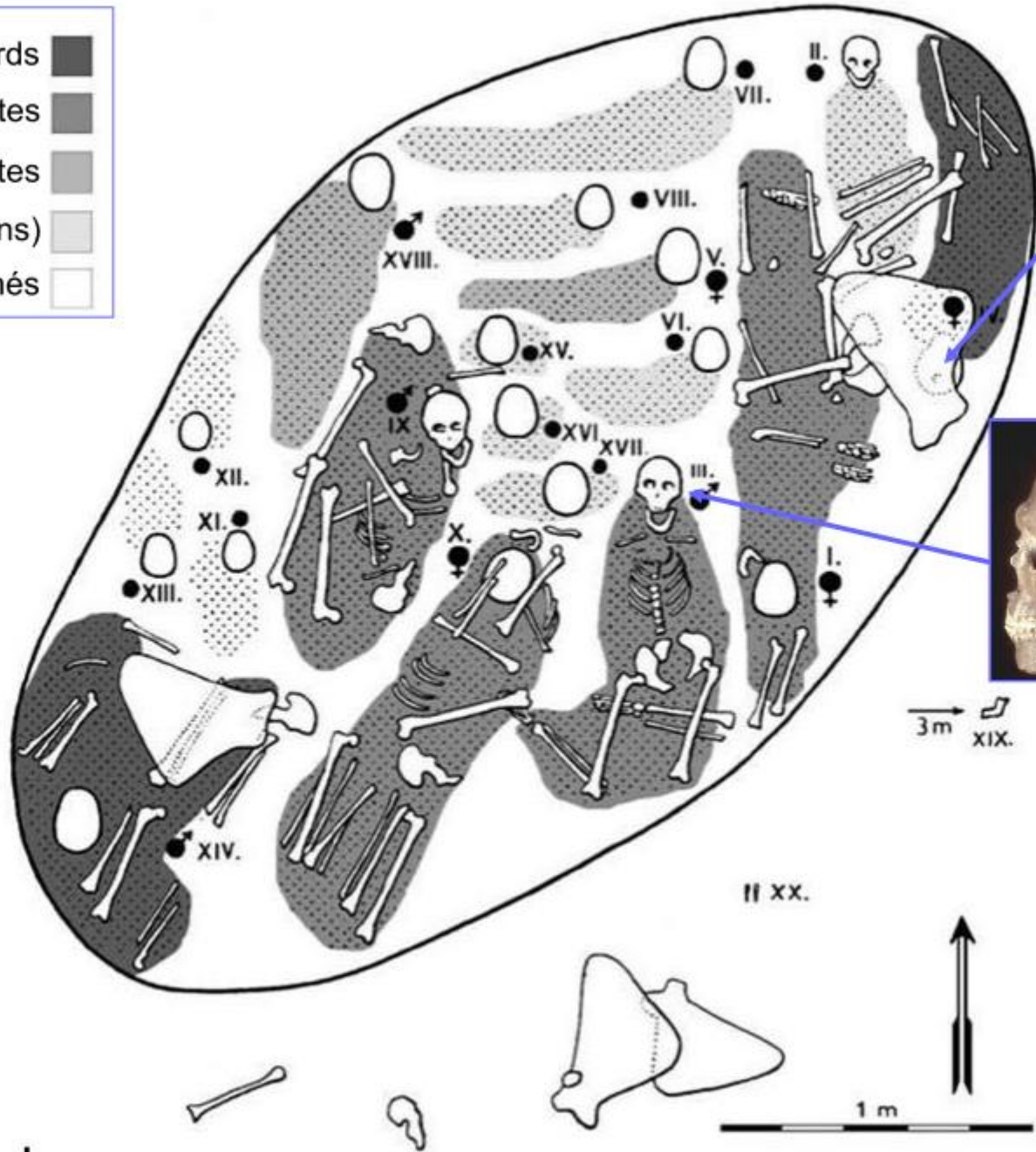


Triple burial (Mladec 5, 6 and 46)

Predmost III, Czech Republic
28 – 20 000 y BP



- 2 vieillards
- 2 "couples" adultes
- 2 jeunes adultes
- 7 enfants (2-14 ans)
- 3 nouveaux nés



Predmost
Multiple burial



Peștera cu Oase, Romania

34 290 +/- 900 BP



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Journal of Human Evolution 45 (2003) 245–253

News and Views

Early modern human cranial remains from the Peștera cu Oase, Romania

Erik Trinkaus^{a*}, Ștefan Milota^b, Ricardo Rodrigo^c, Gherase Mircea^b,
Oana Moldovan^d

^aDepartment of Anthropology, Campus Box 1114, Washington University, St. Louis, MO 63130, USA

^bPRO ACVA GRUP, Str. Surduc 1, 1900 Timișoara, Romania

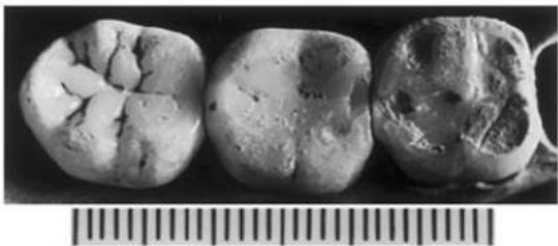
^cCentro Nacional da Arqueologia Náutica e Subaquática, Instituto Português de Arqueologia, Avenida da Índia 136,
1300 Lisboa, Portugal

^dInstitutul de Speologie “Emil Racoviță,” Clinicilor 5, P.O. Box 58, 3400 Cluj, Romania

Keywords: Human paleontology; Early modern humans; Europe; Late Pleistocene

Conclusion

The 2002 discovery of a human mandible at the Peștera cu Oase in southwestern Romania indicates that the earliest “modern” Europeans combined a variety of archaic *Homo*, derived early modern human, and possibly Neandertal features in their cranio-facial skeletal and dental morphology. Although compatible with some degree of admixture between regional Neandertal populations and in-dispersing early modern humans, the Oase 1 mandible is particularly relevant for emphasizing the degree to which early modern humans were not particularly modern.



(Trinkaus, 2003)

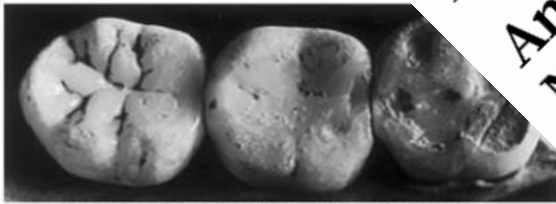


Pestera cu Oase, Romania 34 290 +/- 900 BP



Conclusion

The 2002 discovery of a human mandible in southwestern Romania indicates that Europeans combined a variety of modern human, and possibly Neanderthal, facial skeletal and dental features with some degree of anatomical continuity. This mandible is particularly significant because it shows which early modern



LETTER

An early modern human from Romania with a recent Neanderthal ancestor

Qiaomei Fu^{1,2,3,*}, Mateja Hajdinjak^{3,*}, Oana Teodora Moldovan⁴, Silviu Constantin⁵, Swapan Mallick^{2,6,7}, Pontus Skoglund², Nick Patterson⁶, Nadin Rohland², Iosif Lazaridis², Birgit Nickel³, Bence Viola^{3,7,8}, Kay Prüfer³, Matthias Meyer³, Janet Kelso³, David Reich^{2,6,9} & Svante Pääbo³



Early r

doi:10.1038/nature14558

An early modern human from Romania with a recent Neanderthal ancestor

23) 245–253

the Peștera cu

se Mircea^b,

Louis, MO 63130, USA
mania
Arqueologia, Avenida da India 136,

Box 58, 3400 Cluj, Romania

scene

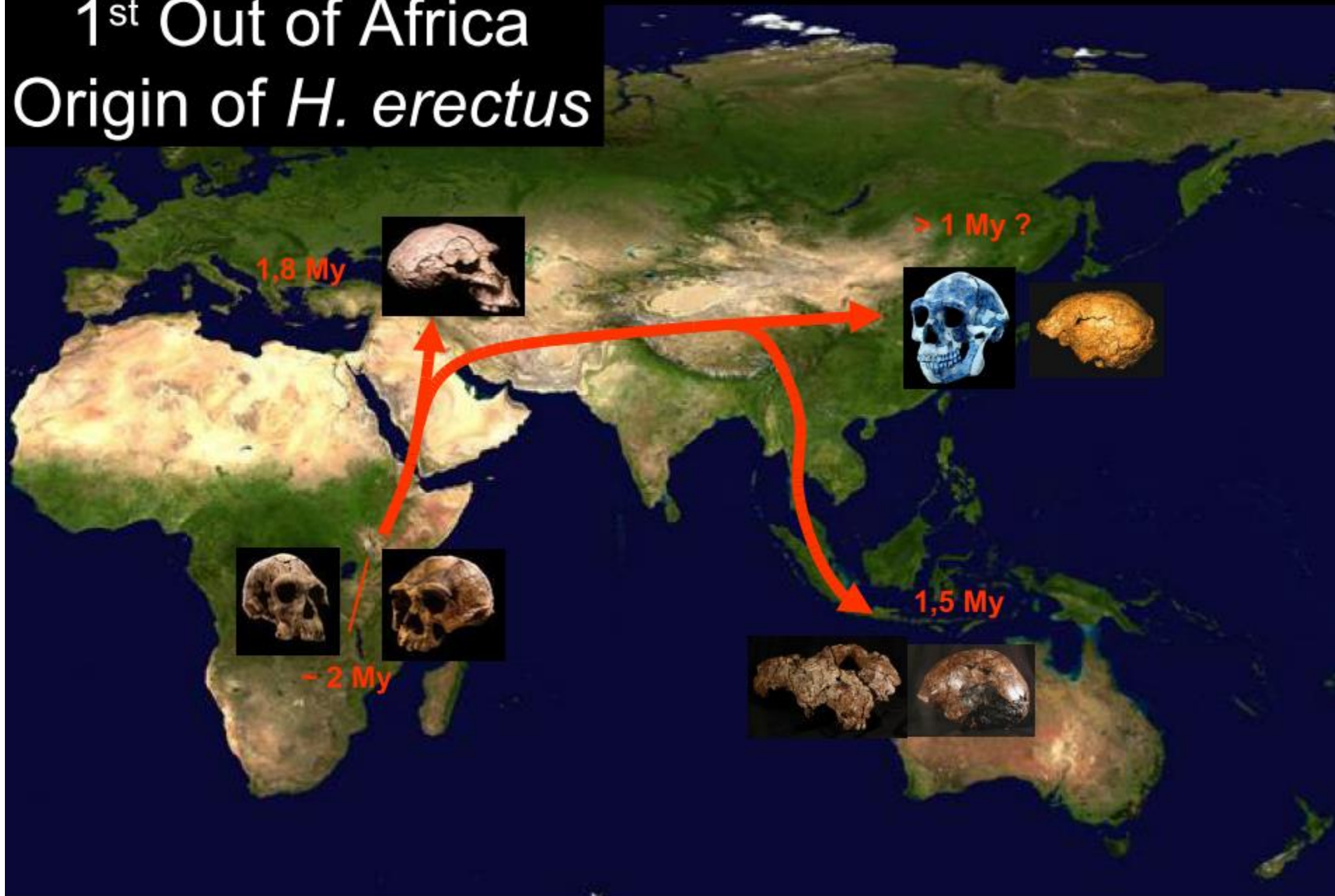
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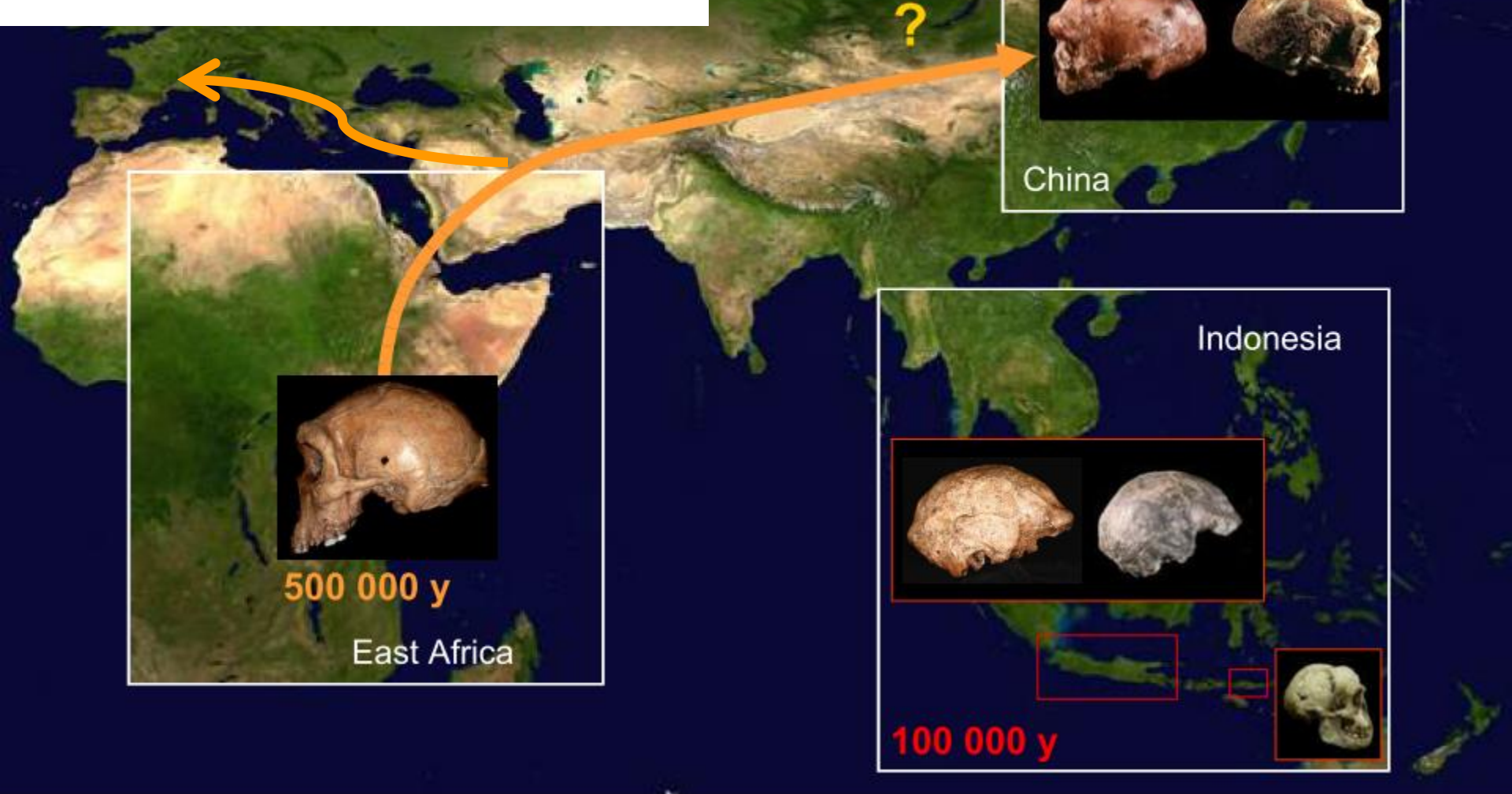


1st Out of Africa Origin of *H. erectus*



2nd Out of Africa “archaic” *H. sapiens*

H. heidelbergensis?



3rd Out of Africa *Homo sapiens*

