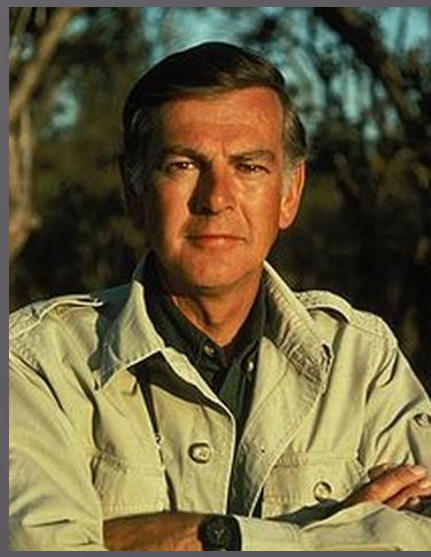
# A Brief Historical and Biographical History of Paleoanthropology Part III

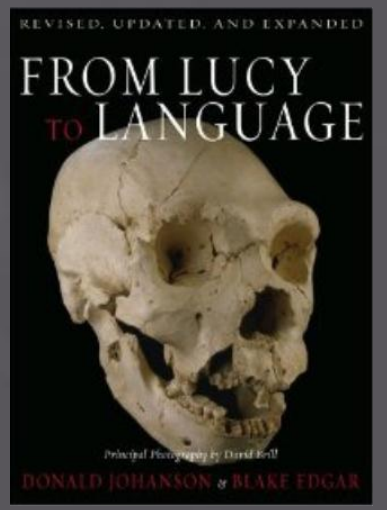
Charles J. Vella, PhD
Nov. 14, 2012

# Donald C. Johanson (1943-): *Australopithecus afarensis*, "Lucy"



- American paleoanthropologist
- Student of F. Clark Howell; Dissertation: modern chimp dentation

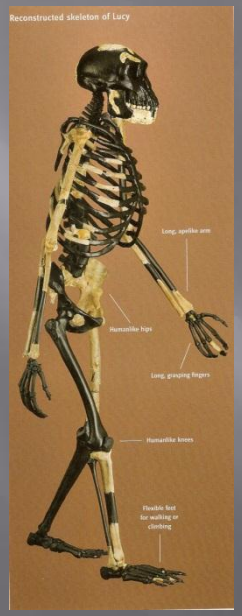
- 1974: Maurice Taieb, Yves Coppens and Tim White, at Hadar, Ethiopia, discovered "Lucy", *Australopithecus afarensis*, 3.2M (student Tom Gray spotted first fragment); bipedal ape




- 1975: the "First Family," AL 333, is a collection of 200 Australopithecus afarensis teeth and bones (13 individuals) discovered in Hadar, Ethiopia, by Johanson's team

- 1981: Institute of Human Origins, Arizona State University

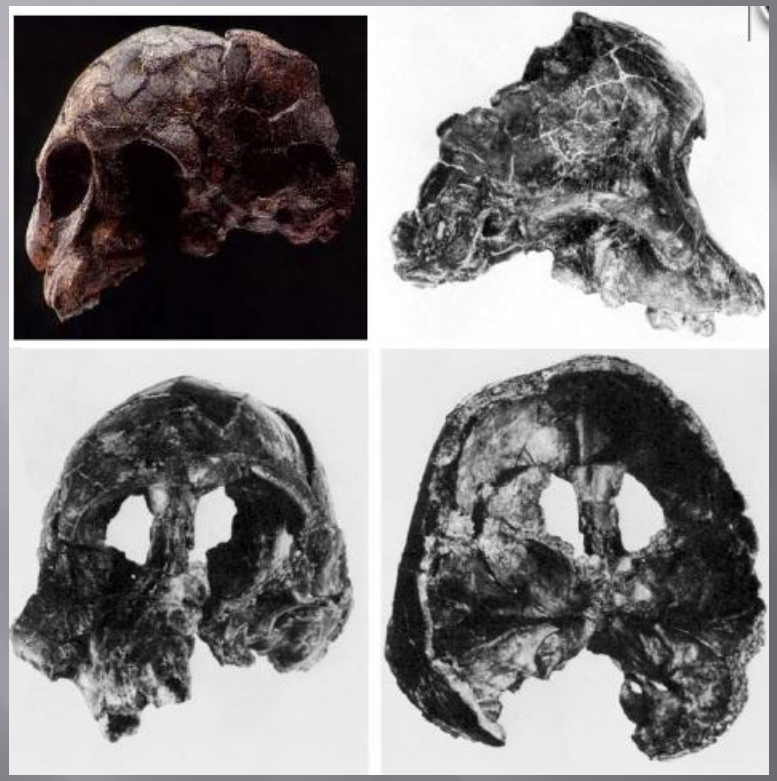
# Don Johanson: *Australopithecus afarensis*




*Australopithecus afarensis*
(A. L. 288-1, "Lucy")
Discoverer: Don Johanson
Locality: Hadar, Ethiopia
Date: 1974
Age 3.2 M

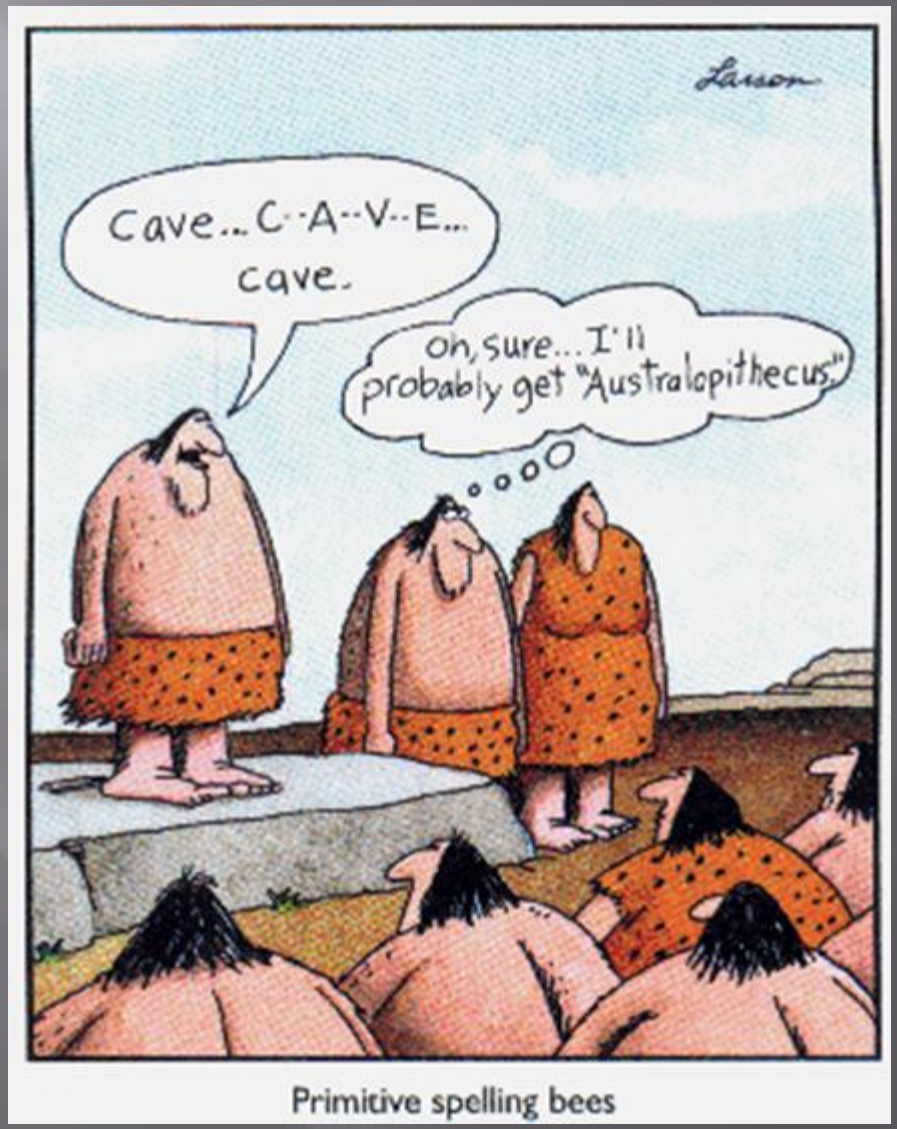
*Australopithecus afarensis*
(L.H. 4, type specimen)
Discoverer: Maundu Muluila
Locality: Laetoli, Tanzania
Date: 1974
Age 3.6 M

# *A. afarensis*, "First Family", fragments of 13 individuals



*Australopithecus afarensis*
(A.L. 333-105, juvenal)
Discoverer: Michael E. Bush
Date: 1975
Locality: Hadar, Ethiopia
Age: 3. 2 M

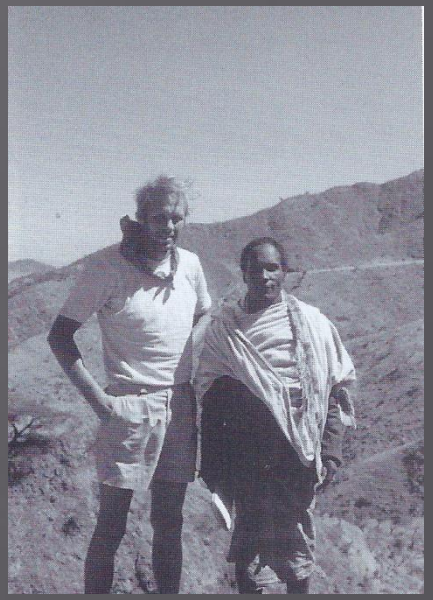
# Australopitchine Spelling Bees

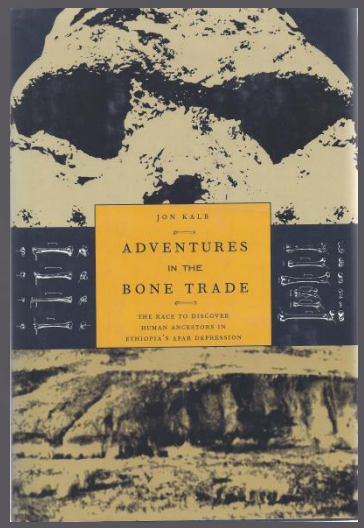



Primitive spelling bees

# Jon Kalb (1941-)

- Research geologist
- A founder of the International Afar Research Expedition and member of Middle Awash project
- 1976: Led team that discovered Bodo, Ethiopia *Homo heidelbergensis* skull
- Expelled from Ethiopia in mid-1978 amid fabricated allegations he spied for the CIA.
- 2002: Author: *Adventures in the Bone Trade*





# Bodo, 1976, *Homo heidelbergensis*

Photograph by Donald Johanson.

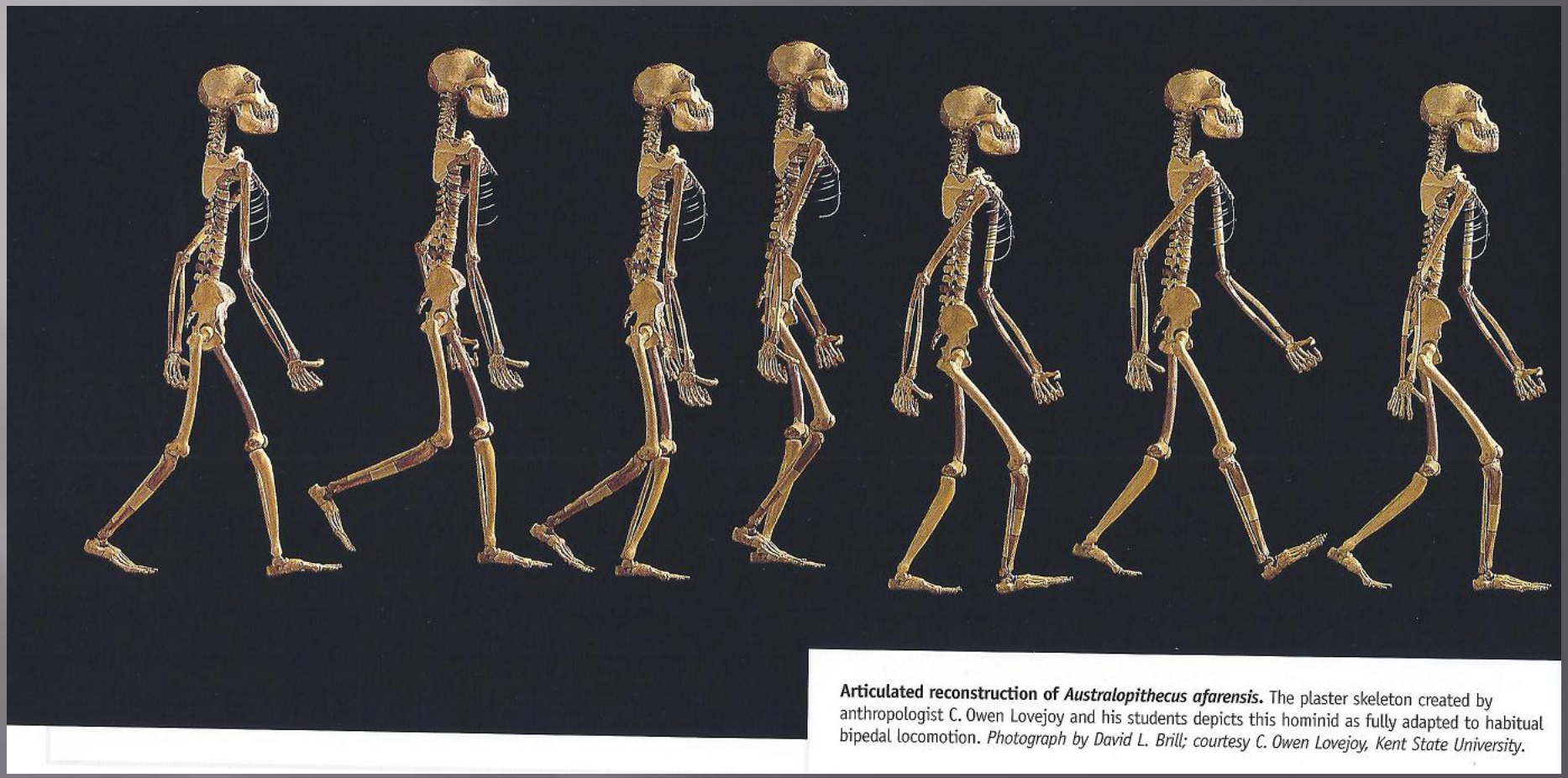
Photograph by Donald Johanson.

- Homo heidelbergensis
- 1976
- Discoverers: Alemayhew Asfaw, Paul Whitehead, and Craig Wood
- Date: c 600K

# C. Owen Lovejoy (1943-): Bipedal locomotion

- Functional anatomist and biological anthropologist
- Kent State University, Ohio and Director of the Matthew Ferrini Institute for Human Evolutionary Research
- Work on **reconstructing Lucy and *Australopithecine* locomotion and the origins of bipedalism**; Lucy as upright biped with strident gait
- Biological analysis of Ardi
- **Provisioning Model: Theorized that upright walking was closely tied to monogamous mating in early hominids**

# Lovejoy: Lucy's ambulation



**Articulated reconstruction of *Australopithecus afarensis*.** The plaster skeleton created by anthropologist C. Owen Lovejoy and his students depicts this hominid as fully adapted to habitual bipedal locomotion. *Photograph by David L. Brill; courtesy C. Owen Lovejoy, Kent State University.*

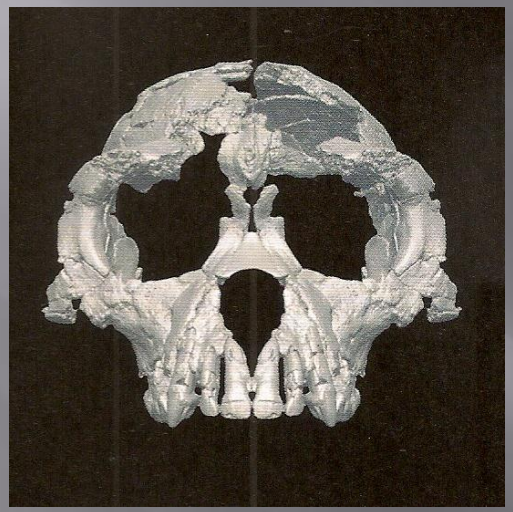
# Tim Douglas White (1950-): Lucy, Ardi, *A. garhi*, *H. sapiens idaltu*

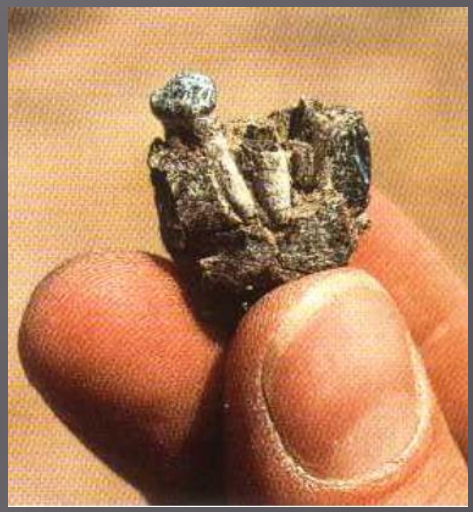
- American paleoanthropologist; student of Milford Wolpoff; Professor of Integrative Biology at the UC, Berkeley
- Head of the Laboratory for Human Evolutionary Studies at the UC, Berkeley
- 1974: White worked with Richard Leakey's team at Koobi Fora, Kenya and then with Mary Leakey at Laetoli, Tanzania.
- 1974: With Don Johanson, discovered Lucy, ***A. afarensis***
- 1992: with Gen Suwa, discovered ***Ardipithecus ramidus*** in Aramis, Ethiopia; 4.4M
- 1996: with Berhane Asfaw, discovered ***Australopithecus garhi;*** 2.5M, in Bouri Formation, Ethiopia
- 1997: co-discovered ***Homo sapiens idaltu***, with Berhane Asfaw, & F. Clark Howell , at Herto Bouri near the Middle Awash, Afar, Ethiopia
- Fellow of CAS

# Berhane Asfaw: Ardi, *A. garhi*, *H. sapiens idaltu*

- Ethiopian paleontologist
- 1981: co-director of the **Middle Awash project with Tim White**
- 1988: **First Ethiopian to receive a doctorate from an American university, UCB**
- 1992: co-discovered, with Tim White, ***Ardipithecus ramidus***
- 1997: discovered ***Australopithecus garhi,*** 2.5 M
- 1997: co-discovered, with Tim White, ***Homo sapiens idaltu*** (elder), 1M.

# *Ardipithecus ramidus*: Tim White & Berhane Asfaw





Discoverer:

Alamayehu Asfaw

Locality: Aramis, Middle Awash, Ethiopia

Age: 4.4 M

1992: *Ardipithecus ramidus*

Type specimen ARA-VP-1/129

Project participant and famous hominid fossil finder Alemayehu Asfaw discovered a hominid lower jaw on February 9, 2006.
Photo by Yohannes Haile-Selassie.

# *A. garhi* & *H. sapiens idaltu*: Tim White & Berhane Asfaw

*Australopithecus garhi*
(BOU-VP-12/130)

Discoverer: Y. Halle-Selassie
Locality: Bouri, Ethiopia
Date 1997

1997: *Homo sapiens idaltu*

Locality: Herto
Date: 1997
Age: 1 M

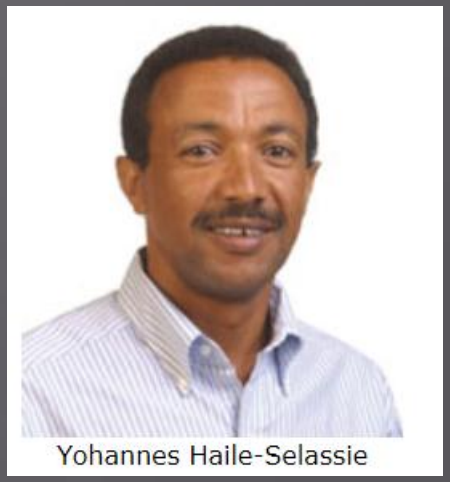
# Gen Suwa: *Ardipithecus ramidus* & CT Scan

- Japanese paleoanthropologist
- University of Tokyo
- 1990: Student of Tim White: working in Ethiopia with the Middle Awash team

- 1992: Found first tooth of *Ardipithecus* in Aramis; worked on the analysis and reconstruction of *Ardipithecus ramidus* for 17 years.
- Specialist with CT scan technology
- 2007: *Chororapithecus abyssinicus*, 10.5-Myr, Miocene ape with gorilla-sized dentition; basal member of the gorilla clade?

# Yohannes Haile Selassie (1961-):
## Ardi ramidus & kadabba, A. garhi, Kadanuumuu

- Ethiopian paleontologist
- Curator and head of the physical anthropology department at the Cleveland Museum of Natural History
- 1994: first to discover the hand-bone of the *Ardipithecus ramidus* skeleton.
- 1996: at W. Margin, Mid. Awash, Ethiopia, discovered *Ardipithecus kadabba*, c. 5.6M
- 1997: discoverer *Australopithecus garhi;* , (BOU-VP-12/130), 2.5M; named it in 2001
- *2005*: discovered Kadanuumuu ("Big Man" in the Afar language), 3.58M, partial *Australopithecus afarensis*, in the Afar Region of Ethiopia; human like gait
- 2012: Critical of Zeray's interpretation of Selam shoulder bone

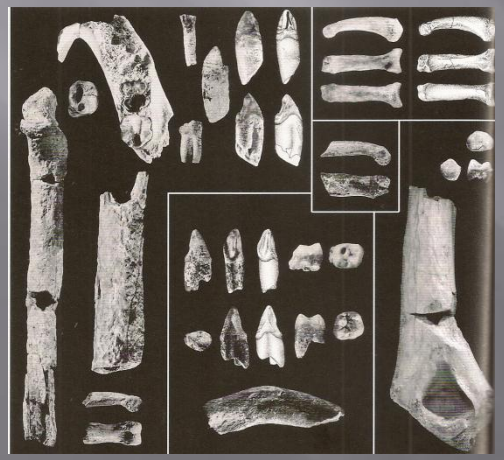

Yohannes Haile-Selassie

# Yohannes Haile Selassie

1994: *Ardipithecus Ramidus* hand bone

1997: *Australopithecus garhi*

2005: Kadanuumuu, *A. afarensis*



1996: *Ardipithecus kadabba*

# Yves Coppens (1934-): *Tchadanthropus uxoris*, Lucy, East Side Story

- French paleontologist & paleoanthropologist
- 1965: discovered a skull of hominid in Yaho (Angamma, Chad), named *Tchadanthropus uxoris*; now closer to *Homo erectus*, 1M.
- 1974: one of the three co-directors of the team that discovered Lucy
- 1983: popularized *East Side Story* model (originally proposed by the Dutch ethologist Adriaan Kortlandt): Creation of the African Rift valley placed Eastern Africa in the drier savannah of the west: created an environmental barrier for split between chimpanzee (wet forests of west) and human gene pools (in dry grasslands of the east).

# Yves Coppens

1965: *Tchadanthropus uxoris (H. erectus)*


Lucy

# Bernard Vandermeersch:
## Qafzeh moderns, Saint-Cesaire & Kebara Neanderthal

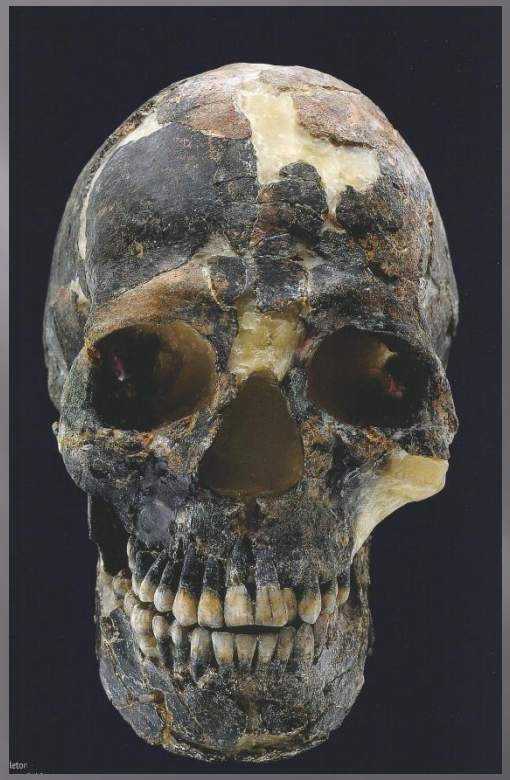
- French Paleoanthropologist
- Professor of Anthropology at the University of Bordeaux.
- 1965-1980: Re-excavated Jebel Qafzeh, Israel
- Described 24 anatomically modern human skeletons found there, 90K
- 1979: Co-authored with Francois Leveque, of paper announcing the "last Neandertal" found at Saint-Cesaire associated with Chatelperronian tools,
- 1983: Part of the team that discovered the Neandertal burial at Kebara Cave
- Lévêque and Vandermeersch, *Bulletin de la Société Préhistorique Francaise* **77**, 35 (1980). 36K

# 1979: *Homo Neanderthalensis*, Saint-Cesaire, one of last

*Homo neanderthalensis* (Saint-Cesaire)
Discoverer: Francois Leveque
Locality: Fierrot's Rock, Charente-Maritime, France
Date: 1979
Age: 36K

# Bernard Vandermeersch

*Homo neanderthalensis*
(Kebara 2, Moshe)
Discoverer: Lynne Schepartz
Locality: Kebara Cave, Israel
Date:1983
Age: 60K



*Homo sapiens*
(Qafzeh IX, female )
Discoverer: Bernard Vandermeersch
Locality: Qafzeh cave, Israel
Date:1969
Age: 90-100K

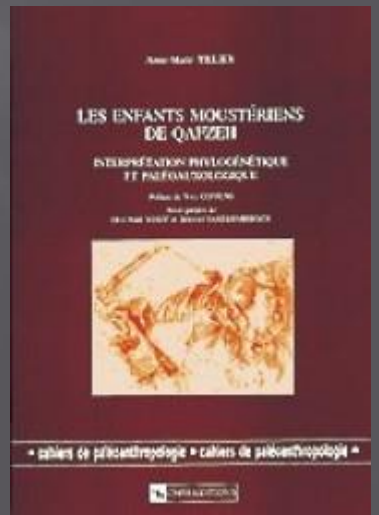
# Cecilio Barroso: Overlap of *H. neanderthalensis & sapiens*

- 1983: Discovered, with Paqui Medina, a Neanderthal mandible in Zafarraya cave (Cueva del Boquete), 30K
- Near the mandible, Mousterian tools dated to 27K. The find was one of the first pieces of definite evidence showing that the presence of Neanderthals and modern humans overlapped in Europe for a significant period, circa 10K.
- Possibly the last of the Neandertals lived here.
- 55 human remains
- 2007: 1,750 page report on the archaeological excavations published.

# Ann-Marie Tillier: Juvenile Neandertals

- French paleoanthropologist
- Trained by Bernard Vandermeersch
- Studied and compared the juvenile material of Neandertals and moderns to understand development

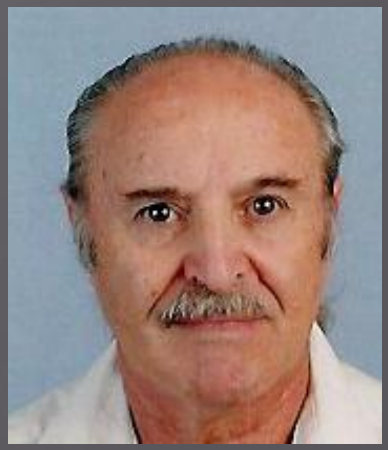
- **1999.** ***Les Enfants Moustériens de Qafzeh. Interprétation Phylogénétique et Paléoauxologique.***



# Lynne Schepartz: Kebara hyoid bone – Neandertals Speak

- Paleoanthropologist
- University of Cincinnati and University of the Witwatersrand
- 1983: Discovered the remains of an adult Neandertal male at Kebara, Israel, the most complete Neandertal skeleton known, including earliest complete hyoid bone.
- Believes Neandertals could speak. She accuses researchers like Lieberman and Laitman, who stick to their belief in modern humans' unique language abilities, of "linguicentrism"

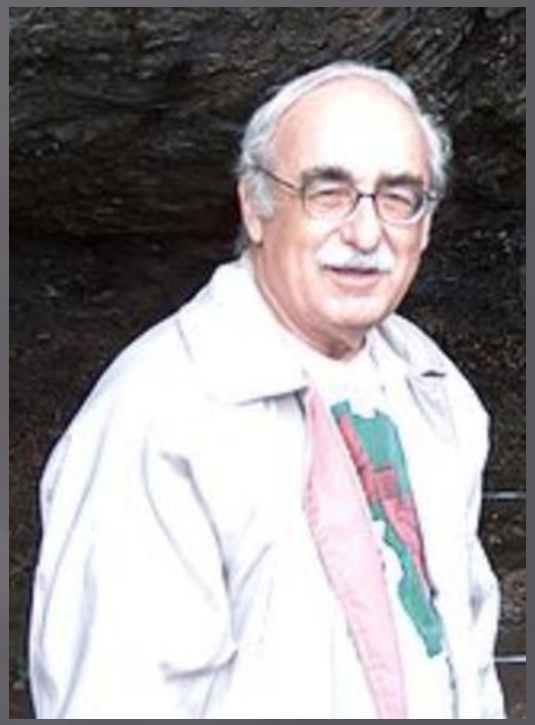
# Baruch Arensburg (1934-): Kebara, Moshe the Neandertal



- Chilean Israeli anatomist and physical anthropologist
- Tel Aviv University
- Co-director (with Ofer Bar-Yosef) of Kebara excavation
- 1982: of the most complete Neandertal skeleton found to date. Nicknamed "Moshe" and dating to *circa* 60,000 BP
- 1987: Co-author of monograph on Kebara Neandertal (includes hyoid bone & nearly complete pelvis)
- Leading authority on the Jewish population of ancient Israel.

# Ofer Bar-Yosef (1937-): Moderns preceded Neandertals in Levant

- Israeli archaeologist
- Professor of Prehistoric Archaeology at Harvard University as well as Curator of Palaeolithic Archaeology at the Peabody Museum of Archaeology and Ethnology.
- Co-directed Kebara excavation.
- Defended idea that anatomically modern humans preceded Neandertals in Levant

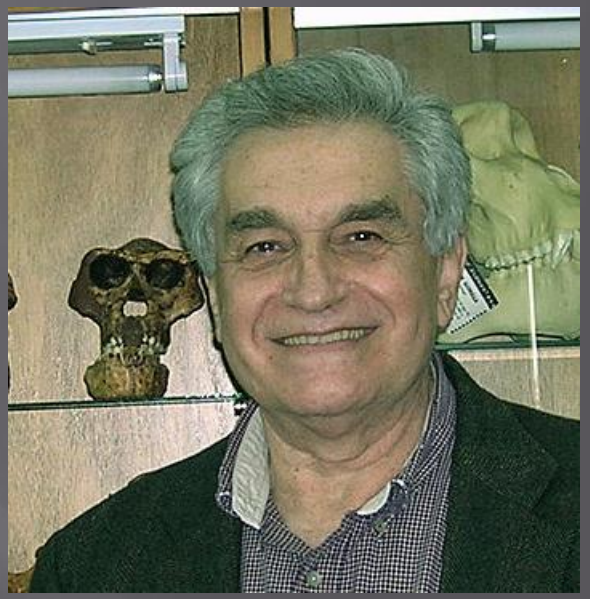


# *Homo neanderthalensis*, Kebara: Most complete Neandertal specimen

*Homo neanderthalensis*
(Kebara 2)
Discoverer: Lynne Schepartz
Locality: Kebara Cave, Israel
Date:1983
Age: 60K

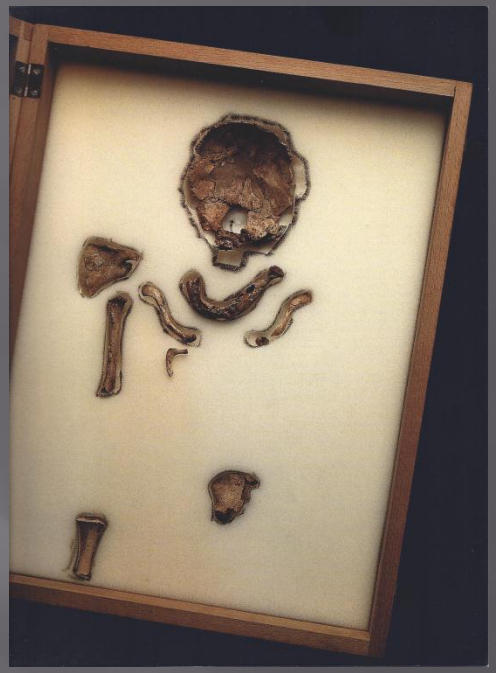
# Yoel Rak (1946-): Kebara Neandertal & *A. afarensis*

- Israeli physical anthropologist; Tel Aviv University
- 1987: Co-author of description of Neandertal skeleton from Kebara: Rak and Arensburg, *Am. J. Phys. Anthropol.* **73**, 227 (1987).
- Includes a hyoid bone and a nearly complete pelvis
- 1992: *Australopithecus Afarensis* (A. L. 444 -2)
- 1992: *Homo neanderthalensis* (Amud 7 child) – oval foramen magnum



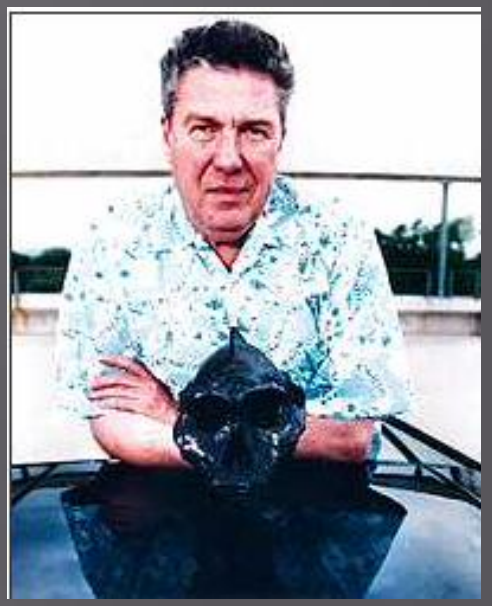
# Yoel Rak

*Australopithecus afarensis*
(A.L. 444-2; 1st relatively complete skull)
Discoverer: Yoel Rak
Locality: Hadar, Ethiopia
Age: 3 M
Date 1992



*Homo neanderthalensis*
(Amud 7)
Discoverer: Tina Hietala & Yoel Rak
Locality: Amud Cave, Israel
Age: 50-60K
Date 1992

# Alan Walker (1938-): *Paranthropus aethiopicus*



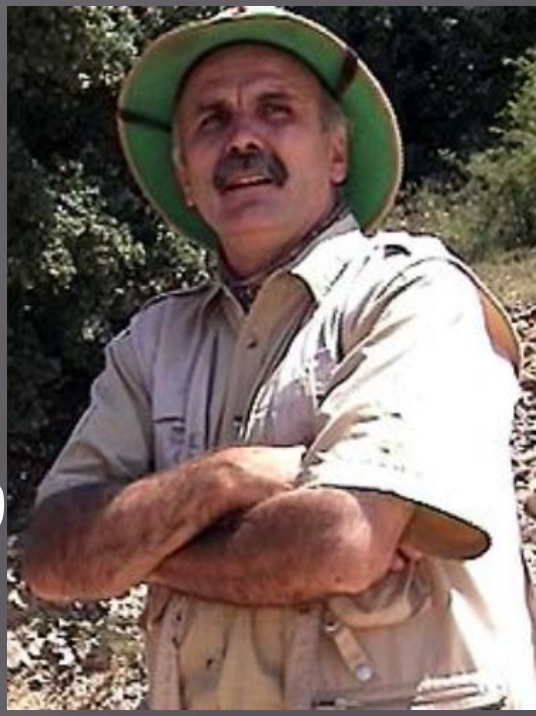
- Professor of anthropology and biology at Penn State University
- 1994: Description of *A. anamensis*
- 1985: discovered, at Turkana, Kenya, skull of *Paranthropus aethiopicus* , KNM WT 17000, 2.5 million years; the "Black Skull"


- **New Four-Million-Year-Old Hominid Species from Kanapoi and Allia Bay, Kenya.** Meave G. Leakey, Craig S. Feibel, Ian McDougall and Alan Walker in *Nature,* Vol. 376, pages 565–571; August 17, 1995.
- **The Earliest Known *Australopithecus, A. anamensis.*** C. V. Ward, M. G. Leakey and A. Walker in *Journal of Human Evolution,* Vol. 41, pages 255–368; 2001.

# *Paranthropus aethiopicus*, KNM WT 17000, Black Skull

*Australopithecus aethiopicus*
(KNM-WT 17000, Black skull)
Discoverer: Alan C. Walker
Locality: Lake Turkana, Kenya
Age: 2.5 M
Date: 1985

# Eudald Carbonell (1953-): *Homo antecessor* at Atapuerca

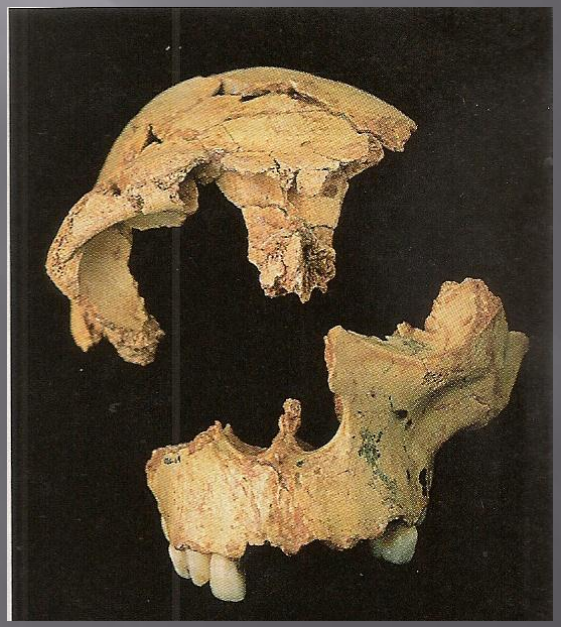


- Catalan Spanish archaeologist, anthropologist and paleonthologist.
- professor at the University of Rovira and Virgili in Tarragona, Spain
- 1994: Co-discover, with Juan Luis Arsuaga, of *Homo antecessor;* at Gran Dolina and Sima del Elefante, Spain; 800 or 300K
- 1991: He has been a co-director of the Atapureca Team since 1991 with José María Bermúdez de Castro and Juan Luis Arsuaga of the Atapuerca Team

- Many think *H. antecessor* is *Homo heidelbergensis*

# Eudald Carbonell & Juan Luis Arsuaga: *Homo antecessor*

*Homo heidelbergensis*
(Atapuerca 4; 1390 cc)
Discoverer: Juan-Luis Arsuaga
Locality: Sima del los Huesos, Atapuerca, Spain
Age: 350-500K
Date 1992-1993

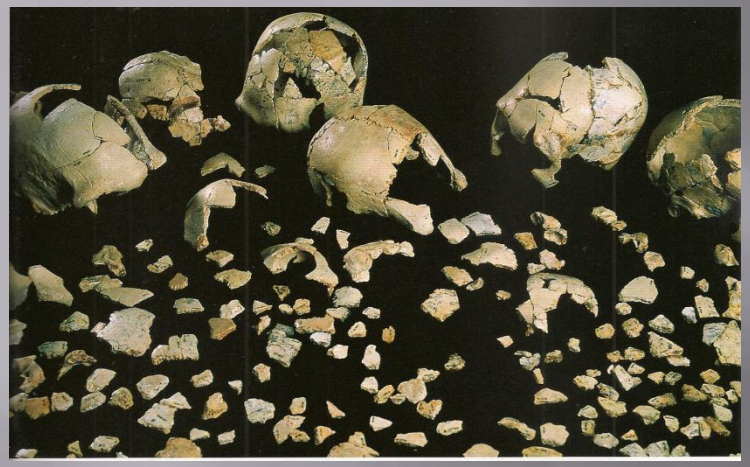


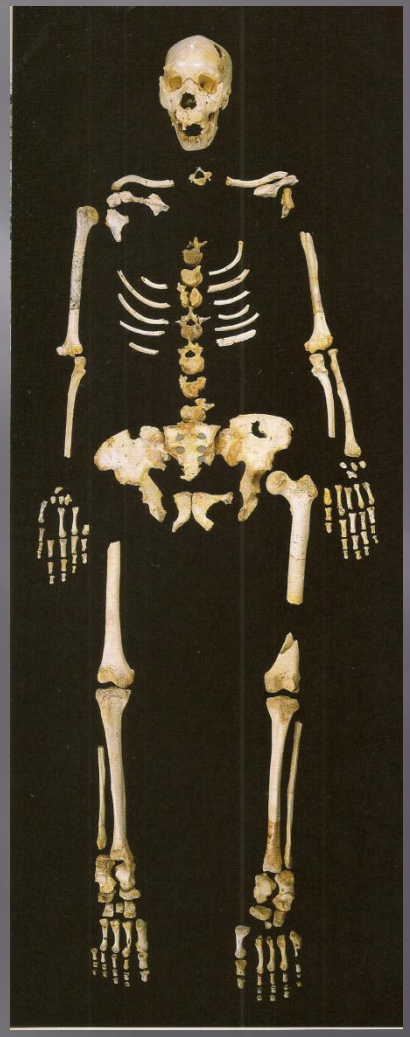
1994: *Homo antecessor*

# Juan Luis Arsuaga (1954-):
## La Sima de los Huesos *Homo heidelbergensis*

- Professor in the Paleontology Department of the Faculty of Geological Sciences, University of Madrid
- 1994: Co-discover, with Eudald Carbonell, of *Homo Antecessor*
- 1991: Co-director of the Atapureca Team since 1991 with José María Bermúdez de Castro and Eudald Carbonell of the Atapuerca Team
- 1992: Excavated La Sima de los Huesos; remains of 28 bodies have been dug up, the world's greatest single haul of ancient *Homo* fossils; dated 600K, Homo heidelbergensis
- Chris Springer believes the Sima de los Huesos site is filled with Neanderthal remains that are no more than 400,000 years old.
- The scientists at La Sima believe *Homo heidelbergensis* is an ancestor of Neanderthals but not of *Homo sapiens*. However, others, including Stringer, believe it is indeed an ancestor of our species.

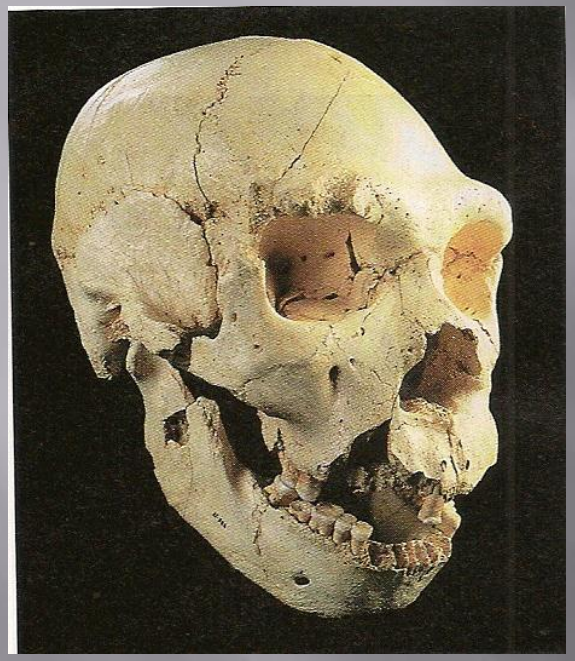
# Atapureca & La Sima de los Huesos





*Homo heidelbergensis or neanderthalensis?*

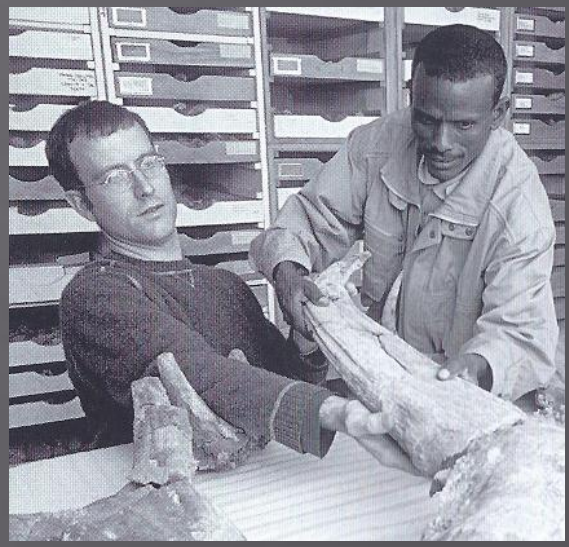
# *Homo heidelbergensis*
# Atapuerca, Spain



1125 cc

*Homo heidelbergensis*
(Atapuerca 5)
Discoverer: Juan-Luis Arsuaga
Locality: Sima del los Huesos, Atapuerca, Spain
Age: 350-500K
Date 1992-1993

# William Henry Gilbert: Middle Awash project, *Homo erectus*



- California State University, East Bay  Ass. Professor, Dept. of Anthropology; 1994-present Human Evolution Research Center, UC Berkeley Laboratory manager
- 1994-2005:  Middle Awash Project
- Early Pleistocene Daka Member of the Bouri Formation. Recovered *Homo erectus* calvaria BOU-VP-2/66.
- Coordinated excavation of *Homo sapiens idaltu* cranium BOU-VP-16/2 and directed vertebrate fossil collection in the Herto Member.
- Recovered hominid cranial fossil BOU-VP-16/18. Recovered *Ardipithecus ramidus* phalanx in Aramis Member in 1996
- 2008: With B. Asfaw, *Homo erectus*: Pleistocene Evidence from the Middle Awash, Ethiopia

# William Henry Gilbert

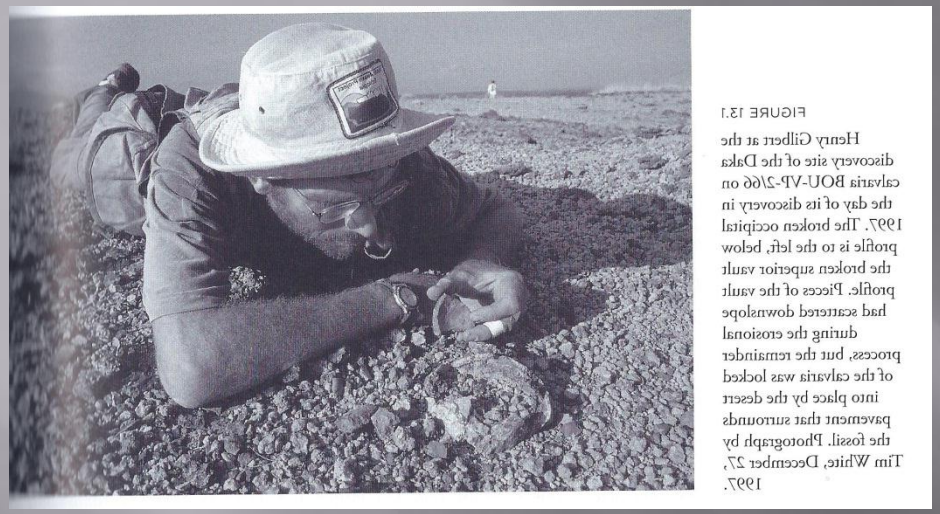
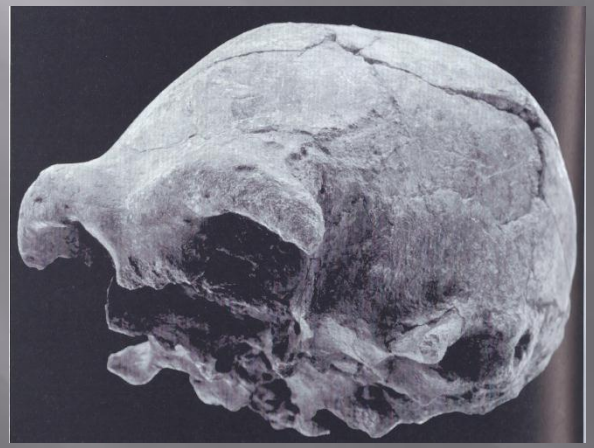
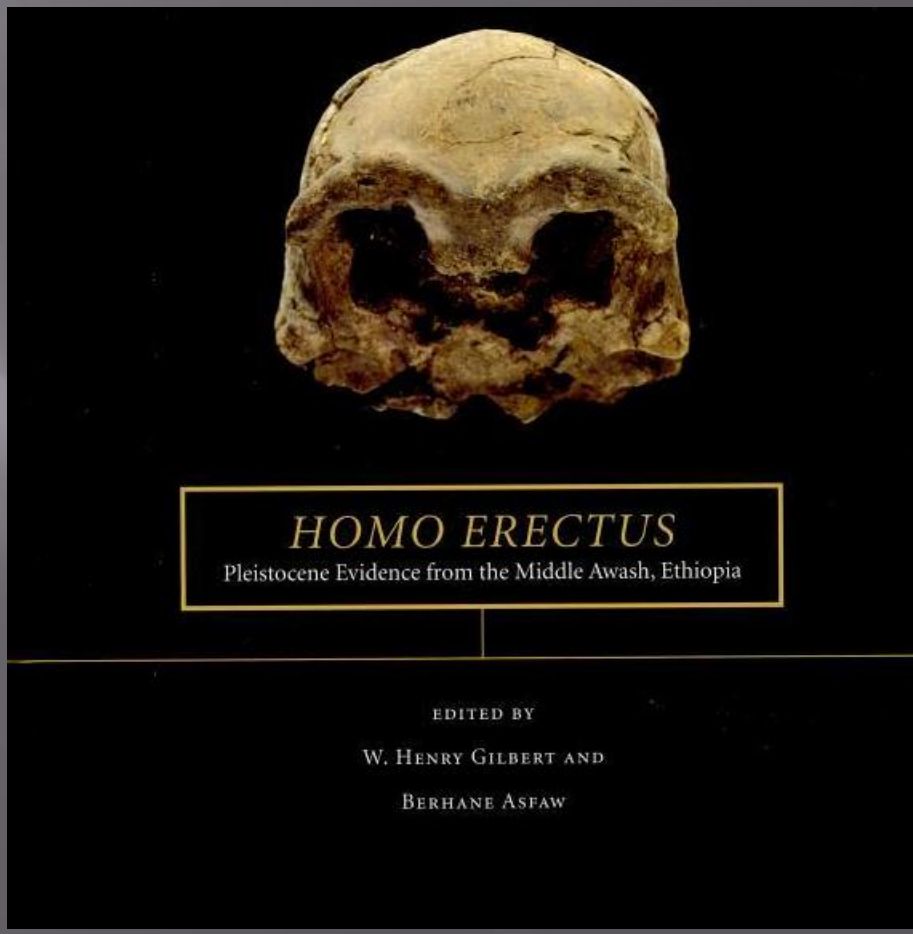


FIGURE 13.1
Henry Gilbert at the discovery site of the Daka calvaria BOU-VP-2/66 on the day of its discovery in 1997. The broken occipital profile is to the left, below the broken superior vault profile. Pieces of the vault had scattered downslope during the erosional process, but the remainder of the calvaria was locked into place by the desert pavement that surrounds the fossil. Photograph by Tim White, December 27, 1997.






*Homo erectus* calvaria BOU-VP-2/66.

# Robin Ian MacDonald Dunbar (1947-): Social Brain Hypothesis

- British anthropologist and evolutionary psychologist
- Professor of Evolutionary Psychology, Univ. of Oxford
- 1998: study proposing the Social Brain Hypothesis, which states brain size increases with social group size and complexity
- Best known for formulating Dunbar's number, roughly 150, a measurement of the "cognitive limit to the number of individuals with whom any one person can maintain stable relationships

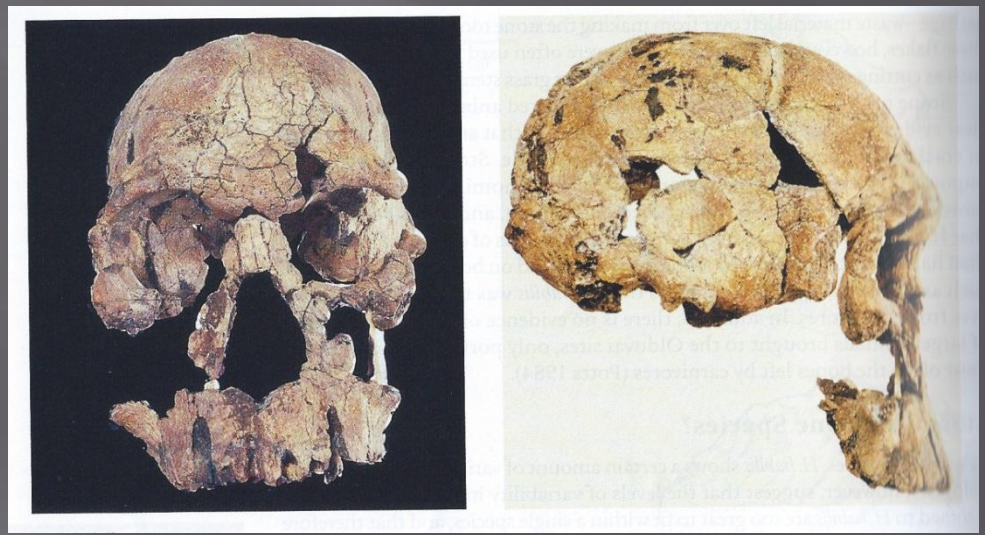
# Bernard A. Wood: Homo classification & Homo rudolfensis

- Physician & paleoanthropologist
- GW University Professor of Human Origins and Professor of Human Evolutionary Anatomy at The George Washington University
- 1968: joined Richard Leakey's first expedition to what was then Lake Rudolf and he has remained associated with that research group
- 1978: *Homo rudolfensis*: The scientific name *Pithecanthropus rudolfensis* was proposed by V. P. Alekseyev
- 1999: It was changed to *Homo rudolfensis* by Bernard Wood, for the specimen KNM-ER 1470
- One of the great theoreticians about the genus Homo: thinks *H. habilis* is not *Homo*

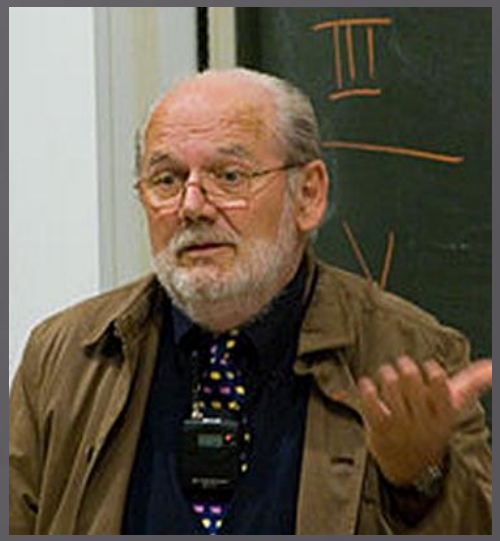
# *Homo rudolfensis*, KNM ER 1470

KNM-ER =
Kenya National Museum-East Rudolf

775cc; assembled by Maeve Leakey



# Michel Brunet (1940-):
## *A. bahrelghazali & Sahelanthropus tchadensis*

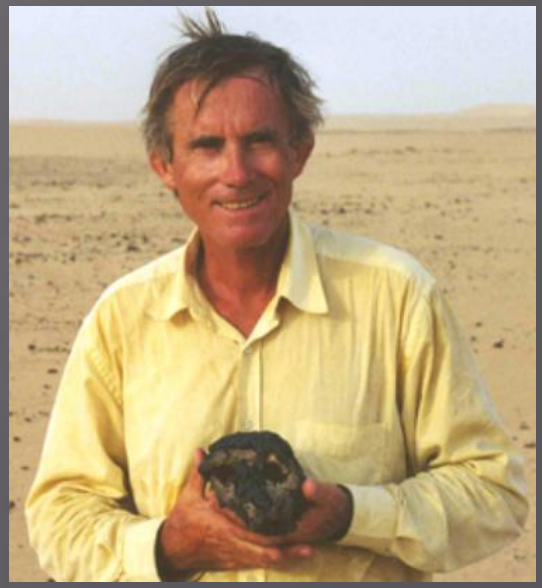


- French paleontologist & professor at the University of Poiters.
- Formed the French-Chadian Paleoanthropological Mission (*Mission Paléoanthropologique Franco-Tchadienne* or MPFT)

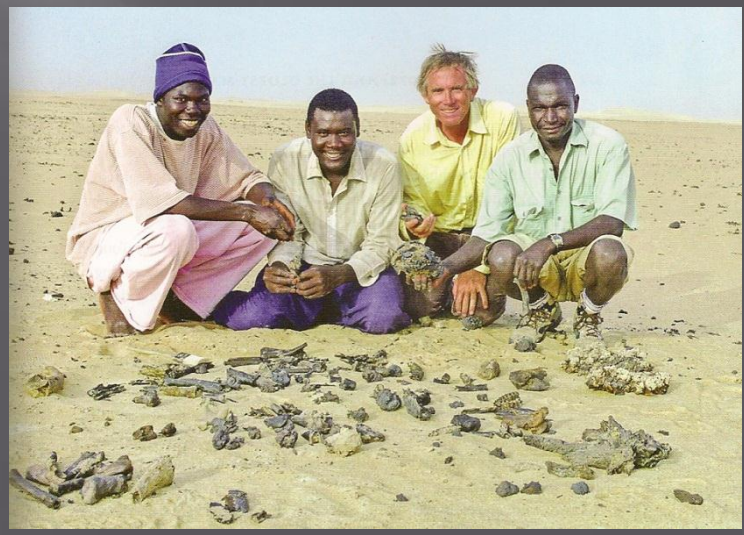
- 1995: with MPFT, in Koro Toro, Chad, discovered *Australopithecus bahrelghazali;* (KT-12, Abel), 3.5M

- 2001: with MPFT, Toros-Menalla, Chad, discovered *Sahelanthropus tchadensis;* (Toumai);

# Alain Beauvilain:
## *A. bahrelghazali & Sahelanthropus tchadensis*



- French geographer
- 1995: with MPFT, in Koro Toro, Chad, discovery of *Australopithecus bahrelghazali;*
- 2001: with MPFT, Toros-Menalla, Chad, discovery of *Sahelanthropus tchadensis;* (Toumai)

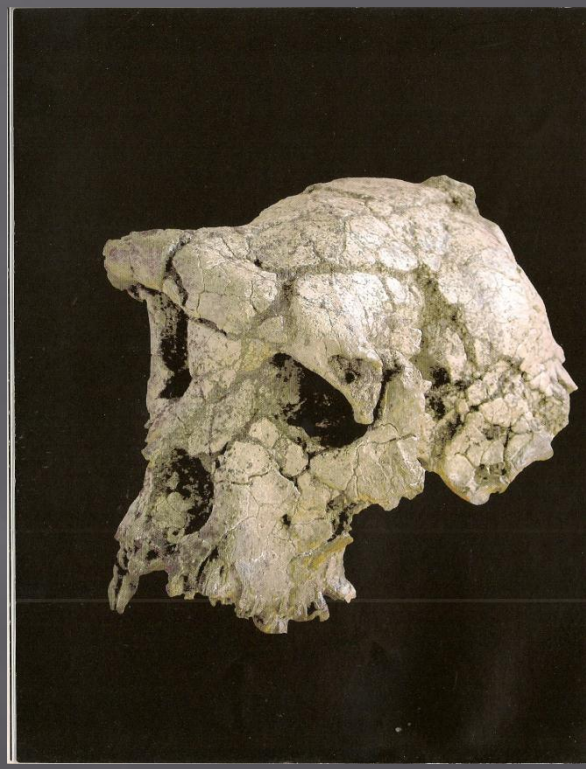


# *Sahelanthropus tchadensis*, Chad: Extension of range of early hominids

1995: *Australopithecus bahrelghazali/afarensis* mandible

Fed mainly on underground parts of grasses and sedges growing in a savanna landscape

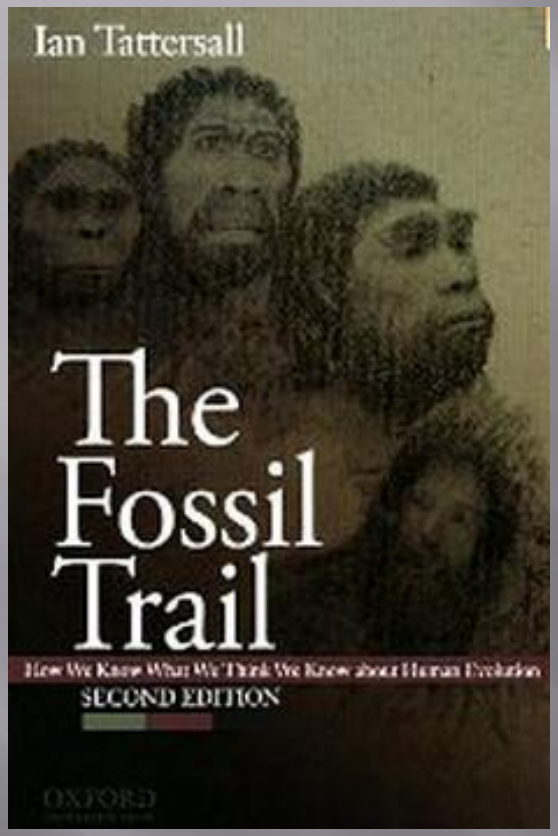
*Sahelanthropus tchadensis,*
( TM 266-01-060-1)
Discoverer: Ahounta Djimdoumalbaye
Locality: Toros-Manalla, Chad,
Date: 2001
Age: 6-7M

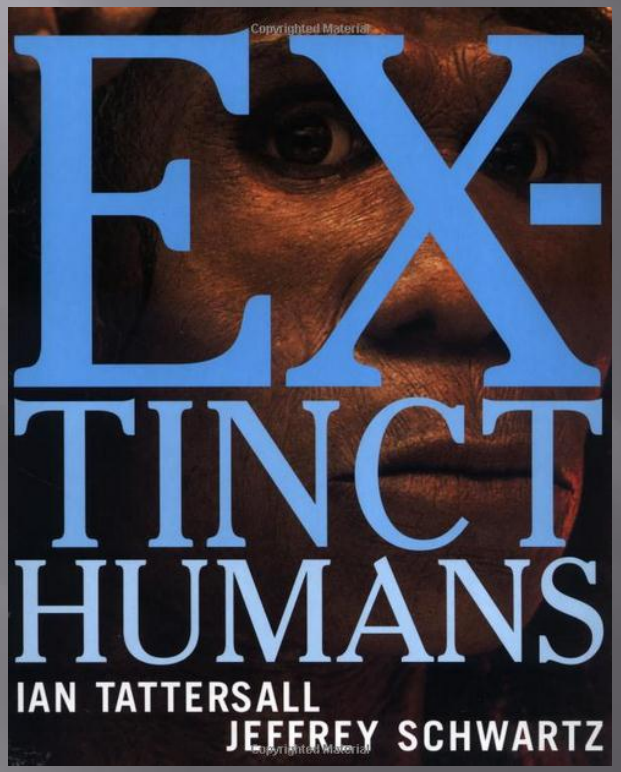


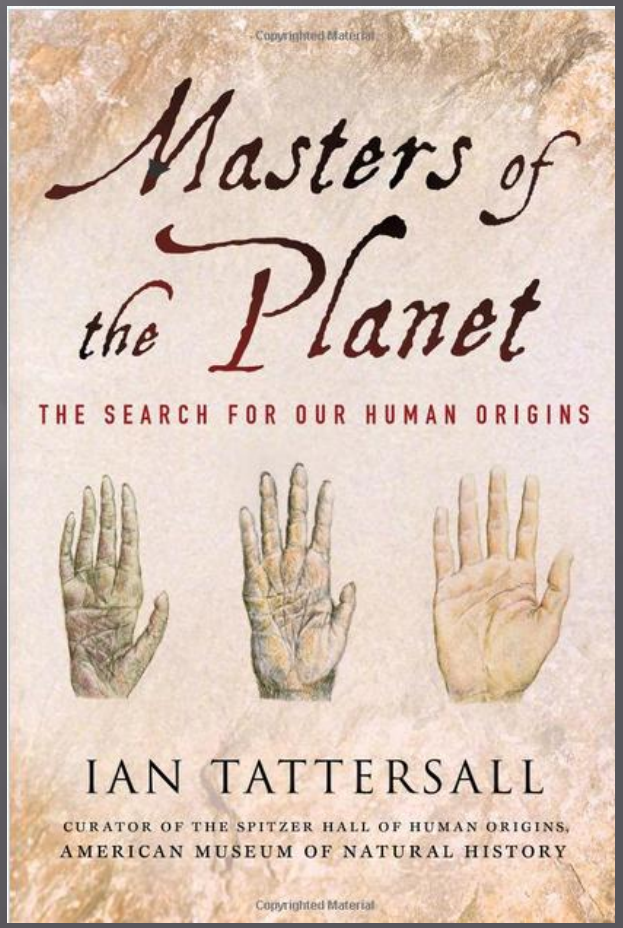
# Ian Tattersall: Great Historian of Paleoanthropology

- American paleoanthropologist; lemur specialist
- Curator at the American Museum of Natural History
- Noted (*Nature* 2006, 441:155) that paleoanthropology is distinguished as the "branch of science [that] keeps its primary data secret."
- Strong critic of modern evolutionary synthesis and proponent of punctuated equilibrium, of diversity of fossil record and of episodic history of experimentation rather than a linear march toward perfection

# Ian Tattersall



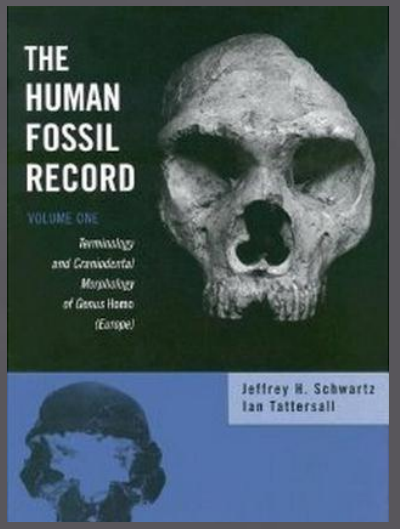



# Jeffrey Hugh Schwartz (1948-): *Human Fossil Record*

- American physical anthropologist
- Professor of biological anthropology at the University of Pittsburgh

- 2001: *Extinct Humans* (with Ian Tattersall)

- 2005: *The Human Fossil Record* (4 volume set) (with Ian Tattersall et al.) (1843 pp.)




- *2005: The Red Ape: Orangutans and Human Origins*
- He presents evidence for his contention that orangutans share significantly more morphological similarities to humans than any other great ape.

# Allan Charles Wilson (1934-1991): Molecular phylogenetics – Mitochondrial Eve

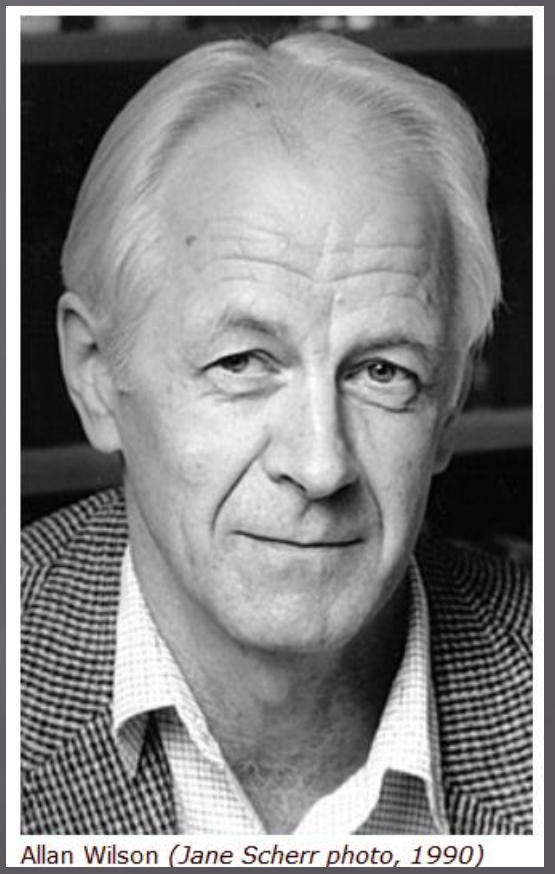
- New Zealand molecular evolutionist at UC Berkeley
- Invented the field of molecular phylogenetics, the modern application of genomics to the study of evolution.
Invented the field of molecular phylogenetics, the modern application of genomics to the study of evolution.

- 967: with Vincent Sarich, pioneered use of biochemical techniques (albumin molecules evolving at constant rage) to measure evolutionary distances and rates (without fossils); apes & humans separate at 5M.

- 1975: found chimps & humans were 98% identical & 5 M divergence.

- 1987, Mother of us all: Best known for his mitochondrial Eve (in Africa c 200K) study. Supports out of Africa; Wolpoff hated it.

- Thought that only difference between N and MH was the articulate speech of latter.

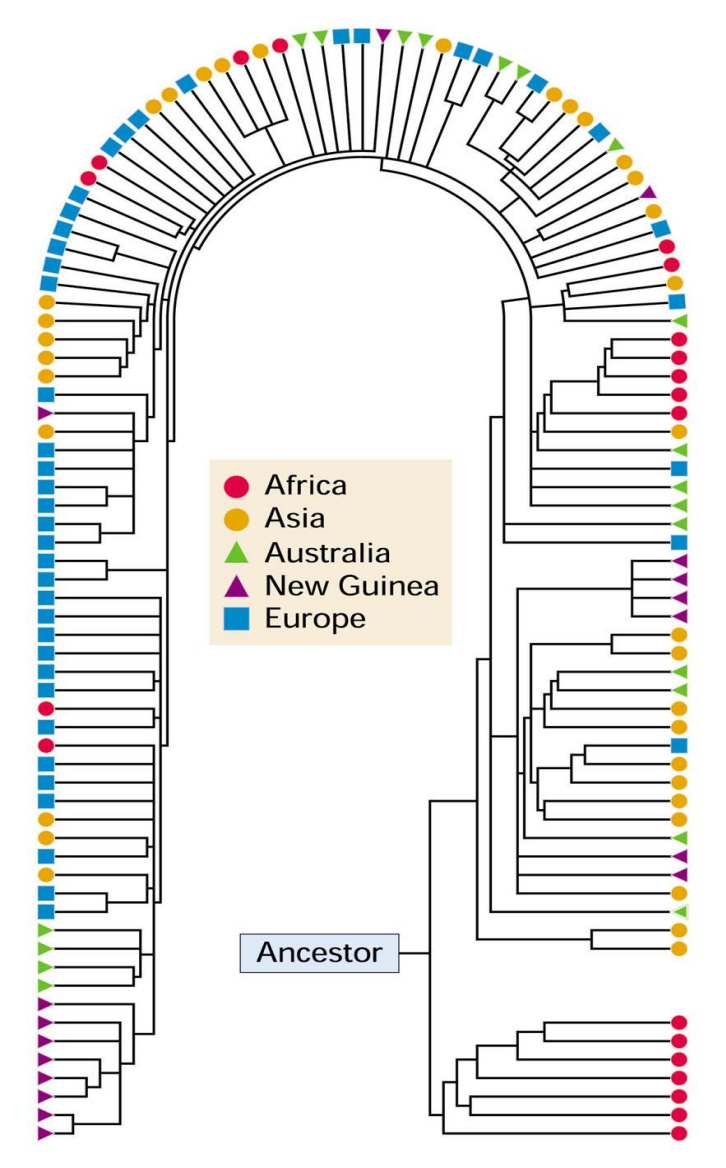


Allan Wilson *(Jane Scherr photo, 1990)*

# Rebecca Cann: Mitochondrial Eve hypothesis

- American biochemist
- Univ. of Hawaii
- PhD thesis focused on mitochondrial DNA implications for evolution
- 1987: *Nature* article, Rebecca Cann and her co-workers, Mark Stoneking and the late Allan Wilson elaborated the mitochondrial Eve hypothesis
- Claims a recent (ca. 100,000 years BP) origin for all modern humans based on a study of mtDNA haplotype links.

# 1987: Mitochondrial Eve Hypothesis



# Maeve Epps Leakey (1942-):

## *Australopithecus anamensis, Kenyanthropus platyops*

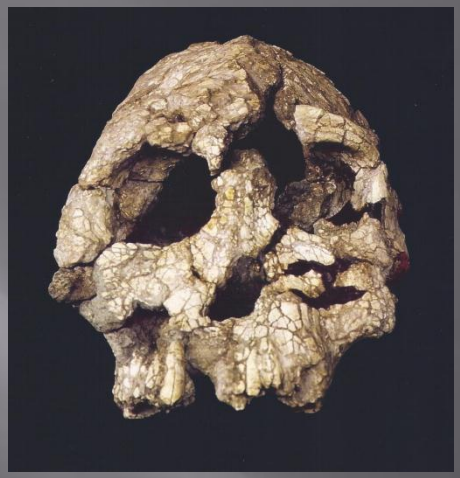
- Paleontologist; Head of the Division of Paleontology at the National Museums of Kenya, 1982-2001.
- Wife of Richard Leakey & mother of Louise Leakey
- 1994: at Kanapoi, Kenya, discovered, with Hominid Gang, the mandible of *Australopithecus anamensis*, 4M
- 1999: discovered and named *Kenyanthropus platyops* (KNM-WT 40000)

# Hominid Gang

- Tim White, John Harris, Kamoya Kemeu's Hominid Gang

# Maeve Leakey:
## *Australopithecus anamensis & Kenyanthropus platyops*


*Australopithecus anamensis*
(KNM-KP 29281)
Discoverer: Peter Nzube
Locality: Kanapoi, Kenya
Date 1994
Age 4.1 M

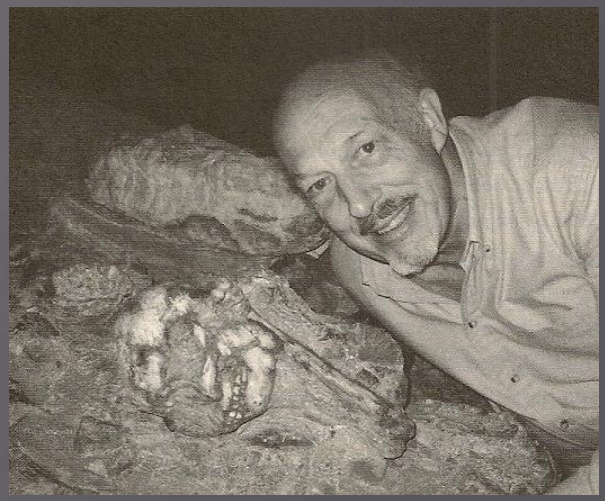


*Kenyanthropus platyops*
(KNM-WT 40000)

Discoverer: Justus Erus
Locality: Lomekwi,
West Turkana, Keny
Date: 1999
Age: 3.5 M

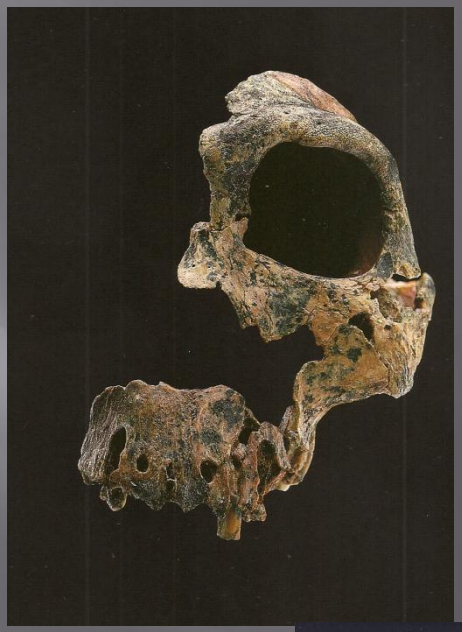
# Ronald J. Clarke: *Homo ergaster* & "Little Foot"

- Paleoanthropologist
- University of the Witwatersrand's Institute for Human Evolution; field director of the ongoing Sterkfontein Caves excavation.



- 1977: Discovered the *Homo ergaster* partial cranium SK 847
- 1995: Most notable for the discovery of "Little Foot", an extraordinary complete skeleton of *Australopithecus*, (StW 573), in the Sterkfontein Caves
- He also played a role in the discovery of a new skeleton of *Homo habilis* related to *Homo rudolfensis*

# Little Foot (*Australopithecus*) & *Homo ergaster* (an early Homo in South Africa)



*Homo ergaster*
partial cranium
SK 847

Discoverer: Ron Clarke
Locality: Swartkrans
Date 1969
Age: 1.5 M

Little Foot

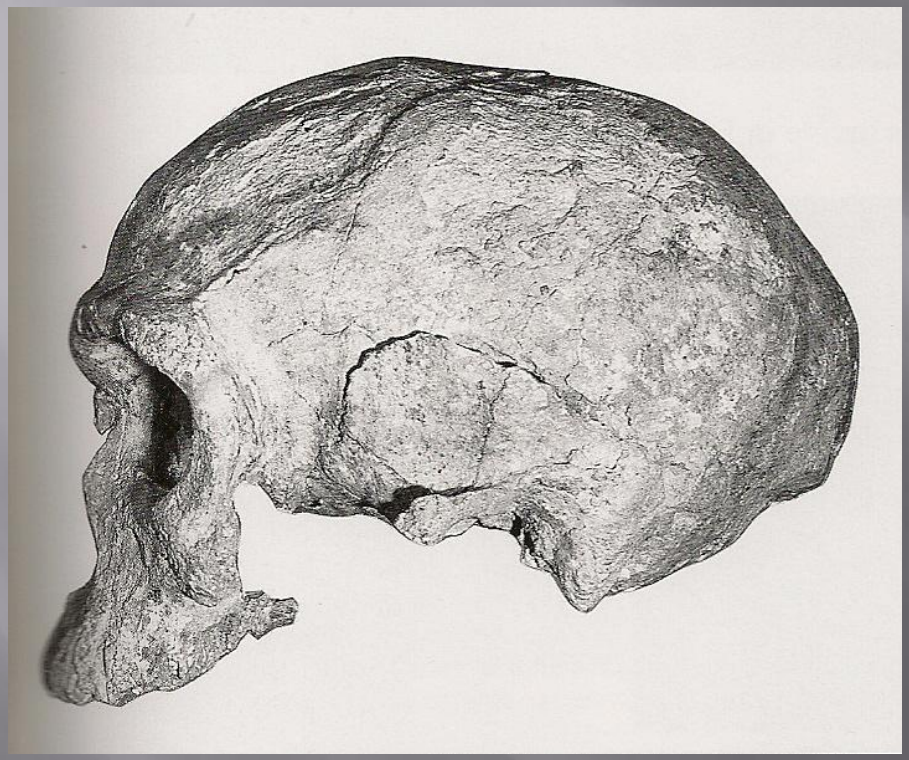
*Australopithecus*
(StW 573)

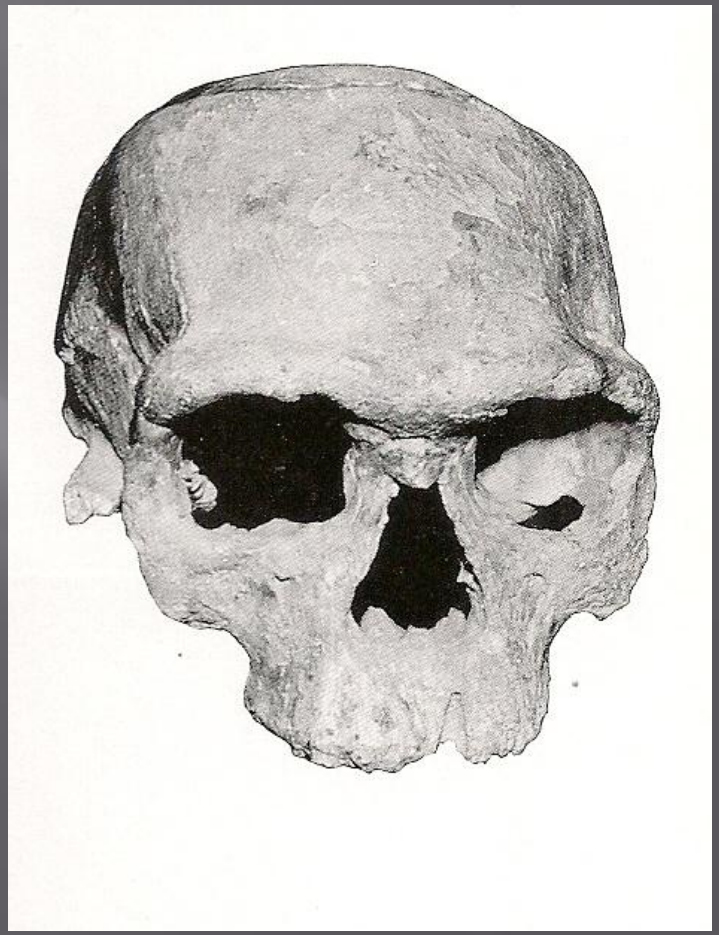
Discoverer: Ron Clarke
Locality: Sterkfontein
Date 1994
Age: 3.0 M

# Jean-Jacques Hublin (1953-): When Neandertals met *H. sapiens*

- French Paleoanthropologist
- Director, the Max Planck Society (Germany) and moved to Leipzig to found the Department of Human Evolution
- 1978: Demolished pre-Sapiens hypothesis: used cladistic methods to demonstrate that Neandertals were much earlier than modern humans. He demonstrated that none of the European fossil material predating 40,000 years ago could be related to modern human ancestry
- Proposed the 'accretion model' for the emergence of the Neandertals (successive occurrence of new features and by an increase in their frequency within the pre-Neandertal populations); and "acculturation" model of final Neanderthal populations by anatomically modern humans
- Jebel Irhoud (Morocco), modern fossils

# Jean-Jacques Hublin



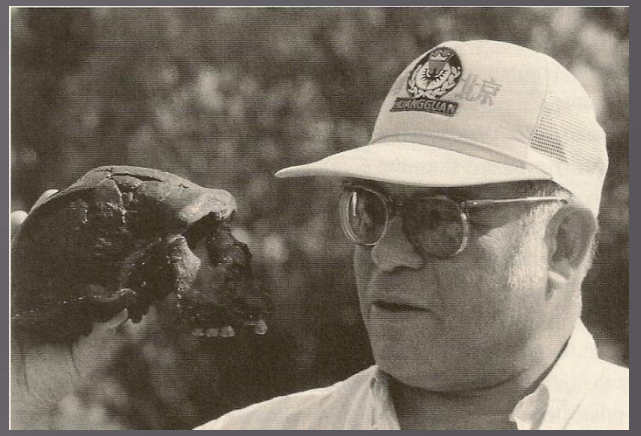


2004: Jebel Irhoud, archaic modern

# C. Loring Brace IV (1930-): Multiregionalism

- Iconoclastic Anthropologist at the University of Michigan
- Student of Ernest Hooton and later with William Howells, and teacher of Dean Falk
- 1962: publishes *Refocusing on the Neanderthal Problem*. There he observes a gradual transition from Mousterian to UP tool-kits, thereby arguing against the "replacement theory" of modern human origins (with Wolpoff);
- A Lumper: extreme variability within species
- Argues that the fossil record suggests a simple evolutionary scheme whereby humans have evolved through only 3 stages (*Australopithecus, Homo erectus, Homo sapiens* (Neandertal, and Modern humans))

# Milford H. Wolpoff (1942- ): Major proponent of single species theory and multiregionalism



- American physical anthropologist; Univ. of Mich.
- With Alan Thorne, updated the multiregionalism hypothesis
- States that different regional groups of *Homo erectus* evolved locally into the different living races of mankind
- Gene flow between groups endowed modern features; theory that evolutionary development in the hominid line subsequent to *H. habilis* have taken place within single species *H. sapiens*
- Disbelieves punctuated equilibrium
- Students: Tim White, John Hawks, Fred Smith

# Multiregionalism

- Modern humans evolved in many locations around the world from a precursor species, *Homo erectus*, approximately one to two million years ago.
- Evolution within a single lineage (H. erectus) throughout the world; emphasis on variability within species.
- These regional populations evolved along parallel paths and reached modernity at roughly the same time. Because the populations were largely isolated from one another, they developed distinctive regional features, which people recognize today as "racial" differences
- Independent evolution of modern traits
- Species changed as a whole while retaining regional characteristics
- .

# Multiregionalism 2

- Dependent on high levels of gene flow to keep us all the same species so we can interbreed
- Postulates a global evolution of humans as opposed to a geographically restricted one in Africa.
- All humans over the last 2 million years are part of the same evolutionary lineage
- The Multiregional hypothesis predicts that the fossilized remains of the earliest modern humans will be found all over the Old World, dated from about the same time.
- Proponents: Franz Weidenreich, C. Loring Brace, Alan Thorne, Milford Wolpoff, John Hawkes, Fred Smith, Wu Xinzhi, Anatoly Derevianko

# Out of Africa or Replacement Theory

- *Homo erectus* spread throughout the world, 1-2 million years ago.
- Modern humans evolved in Africa and then spread around the world. Anatomically modern humans left Africa ~60-200,000 years ago and replaced all other hominid populations throughout the world.
- Little or no interbreeding between modern and older hominid populations.
- All our ancestors lived in Africa 200,000 years ago.

- A major prediction of this hypothesis is that the earliest remains of modern humans will be found in Africa, dated to an appropriate time period.

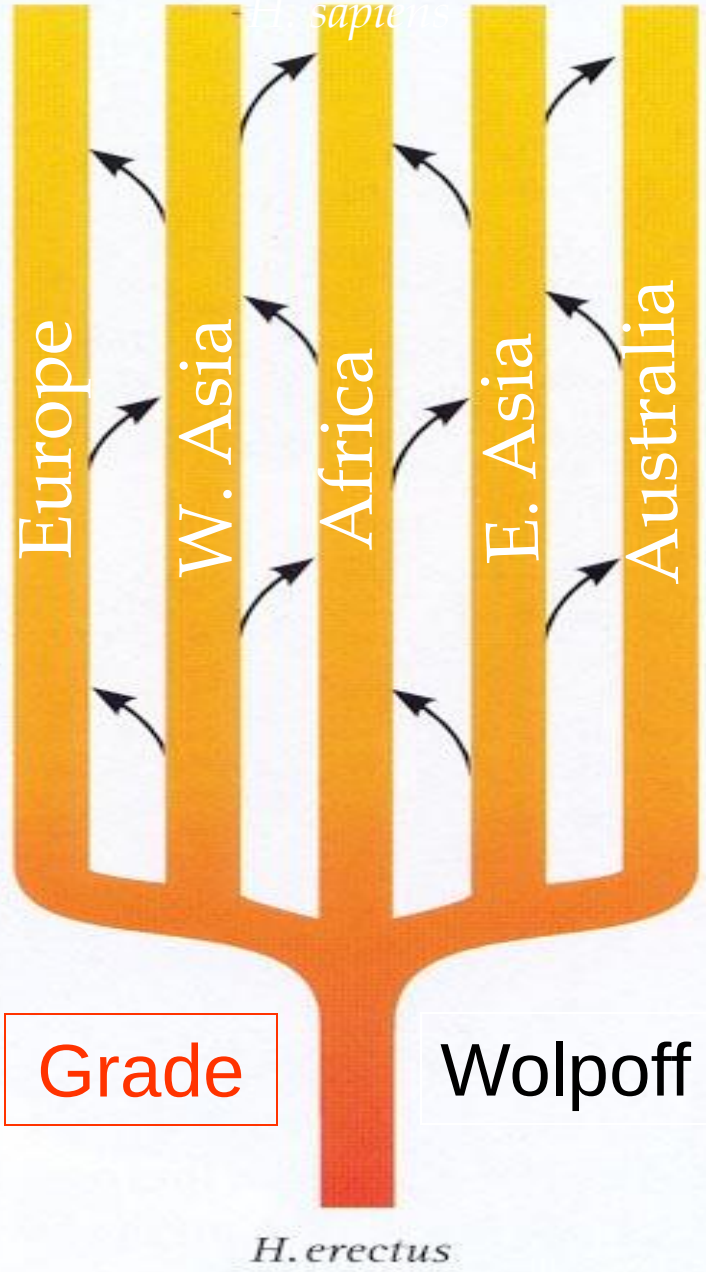
# Replacement Theory

- Evidence vs. Multiregional:
  - Mitochrondrial Eve = African origin
  - Homo Sapiens Idaltu (BOU-VP-16/1, is 1,450cc , Herto, 154-160K, oldest) = African origin
  - mtDNA of Neandertals was not closer to that of the modern Europeans
  - Cro-Magnon mtDNA was unlike the Neandertal sample,
  - Early anatomically modern fossils were also genetically modern

# Assimilation Model

- Relethford's Weak "Out of Africa" model
- Out of Africa model with admixture between archaic, indigenous  populations and modern invading groups
- Basically an intermediate theory between Out of Africa model and multiregionalism
- Interbreeding between two species/subspecies and not independent evolution of modern traits
- Possibly supported by recent molecular genetic data of some interbreeding of modern humans with Neandertals and Denisovians

# Multiregional Evolution




Grade

Wolpoff

# Complete Replacement


Clade

Stringer & Andrews

Russell L. Ciochon

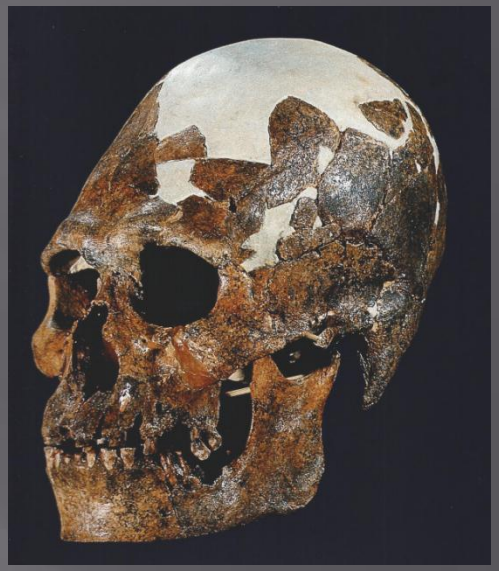
# Alan Thorne (1939-2012): Multiregionalism & Aboriginal origins

- Australian paleoanthropologist
- With Milford Wolpoff, formulated the multiregonalism (or regional continuity) hypothesis
- Authority on interpretations of Aboriginal Australian origins (Lake Mungo (LM1/LM3) and Kow Swamp) and the human genome
- 1999: Moderns entered Australia about 70Kyr
- Believed *H. sapiens*, not *H. erectus*, left Africa in only migration 2M ago & then regional continuity

# *Homo sapiens*, Australia

Lake Mungo Australia
Homo sapiens, Mungo III male, 30K

Kow Swamp 1



Kow Swamp 5

*Homo sapiens*
(Kow Swamp 1)
Discoverer: Alan Thorne & Phillip Macumber
Locality: Kow Swamp, Victoria, Australia
Date: 1967-1968 Age: 10K

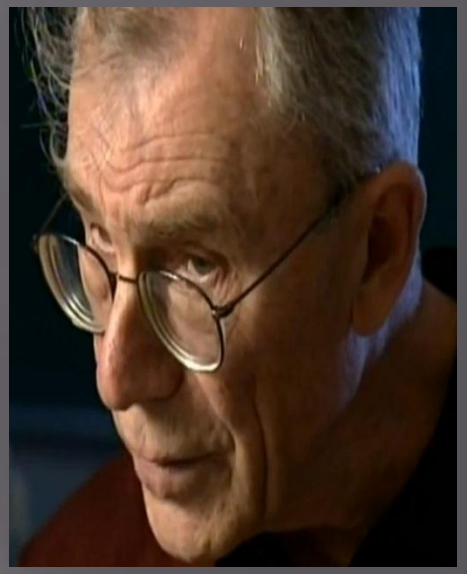
# John D. Hawks: Multiregionalist, Molecular genetics

- Professor of Anthropology at the University of Wisconsin–Madison.
- With Milford Wolpoff, rejects Hublin's accretion model of Neandertal evolution
- Multiregionalist
- Molecular genetics
- Hawks predicted introgression including the Neanderthal admixture hypothesis which was eventually proven by the Neanderthal genome project in May 2010.
- Hawks believes that contemporary human mitochondrial genetics, including lack of any human mitochondrial DNA haplogroups from Eurasian archaic Homo sapiens may be in part due to natural selection of mtDNA on metabolic or other factors, rather than simple total replacement and genetic drift.
- Hominid Evolution Course on Teaching Company DVDs


Teaching Company

# Ralph Holloway (1935-): Hominid brain evolution

- Physical anthropology, evolution of brain and behavior, paleoanthropology
- Columbia University



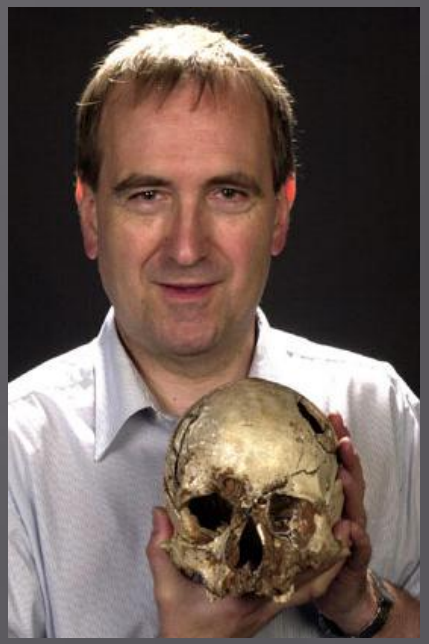
- Hominid Endocasts
- Work on the Taung Child: one of the first to suggest brain reorganization occurring before the increase of brain size in hominids.
- His claim that the lunate sulcus, a sulcus which marks the boundary of the occipital lobe, was in a posterior position to that of apes suggests that the reduction of the occipital lobe was accompanied by enlargements of parts of the brain associated with higher cognitive function.
- 20 year battle with Dean Falk over lunate

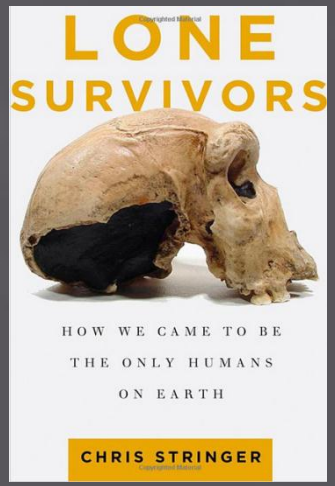
# Gunter Brauer: Out of Africa theory

- Modern German physical anthropologist
- 1976: Günter Bräuer presents the "Out of Africa" hypothesis.
- Argues that earliest modern humans developed from archaic humans in Africa and migrated outward

# Christopher B. Stringer (1947-):
## Out of Africa & Replacement Hypothesis

- Britain's foremost paleontologist
- Department of Paleontology at the Natural History Museum
- 1971: concluded Neanderthals were too different to be human ancestors, based on his quantitative study of the cranial form of Neanderthals in comparison to modern humans.
- Leading exponent of replacement hypothesis (moderns replaced Neandertals)
- Leading exponent of Out of Africa theory





# Erik Trinkaus (1948-):
## Shanidar Neandertals & Hybridization Theory

- Professor of anthropology, Univ. of New Mexico & Washington Univ.
- A leading authority on Neandertals
- 1975: his study of Neanderthal feet confirms they walked like modern humans.
- 1983: Author of *Shanidar Neandertals* and *The Neandertals* (with wife Pat Shipman)
- 1999: The most vocal proponent of the hybridization hypothesis on anatomical grounds. He claims various fossils as hybrid individuals, including the "child of Lagar Velho", in Portugal dated to 24K
- 2003: Pestera cu Oase, Romania

# Joao Zilhao (1957-): Hybridization Theory – Lagar Velho & Oase

- Portugese paleoanthropologist
- Department of Archaeology and Anthropology, University of Bristol
- 1999: with Erik Trinkaus, discovered Lagar Velho , Portugal, child with mixed Neandertal-early modern human ancestry
- 2004: excavations at the Peştera cu Oase (Romania), site of Europe's earliest modern humans.
- Oase: strong argument in favor of an admixture model between regional Neanderthals and early modern humans.
- 2010: 50K Neandertal sites with perforated & pigment-stained marine shells

# Lagar Velho, Portugal: Hybrid child

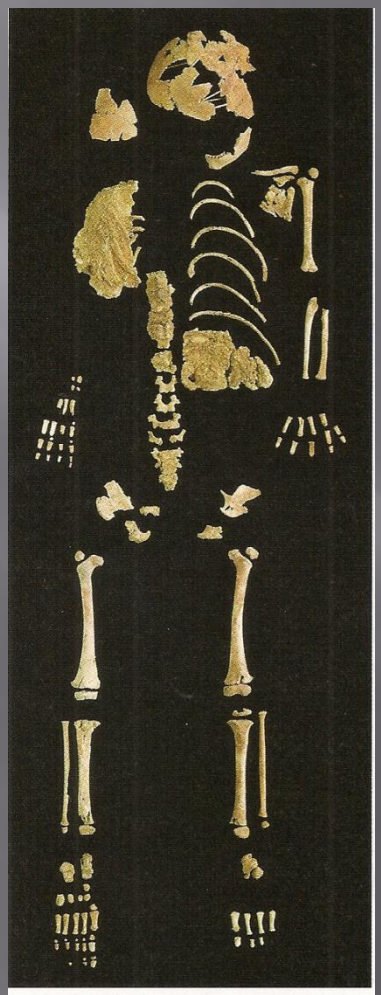


**FIGURE 12.41** ■ **Lagar Velho**
This skeleton of a child was discovered at a rockshelter site in Portugal's Lapedo Valley.

Duarte et al. 1999

# 2003: Pestera cu Oase, Romania

Oase 2, modern human, 38K

Fig. 2. Occlusal view of the Oase 2 palate and molars. Scale in centimeters. Note that the $M^3$s are still in their crypts and are partially visible distal of the $M^2$s.

# Fred H. Smith:
## Multiregionalism – Neandertals as subspecies

- Modern American physical anthropologist, Loyola University
- Student of Milford Wolpoff
- Analysis of Neandertal remains from Vindija and Krapina
- 1976: his study of Krapina Neanderthals leads him to conclude that they were a subspience of H. sapiens

- 2000: Digs in area of the original Neandertal 1 find and discovers additional piece mating with the original skull.

- Assimilation model: Hypothesis that Neandertals evolved into modern humans, assimilation of archaic humans, and are a subspecies of H. sapiens

- N = extinction by hybridization

# 2000: Fred Smith discovers *Homo neanderthalensis 1* fragment

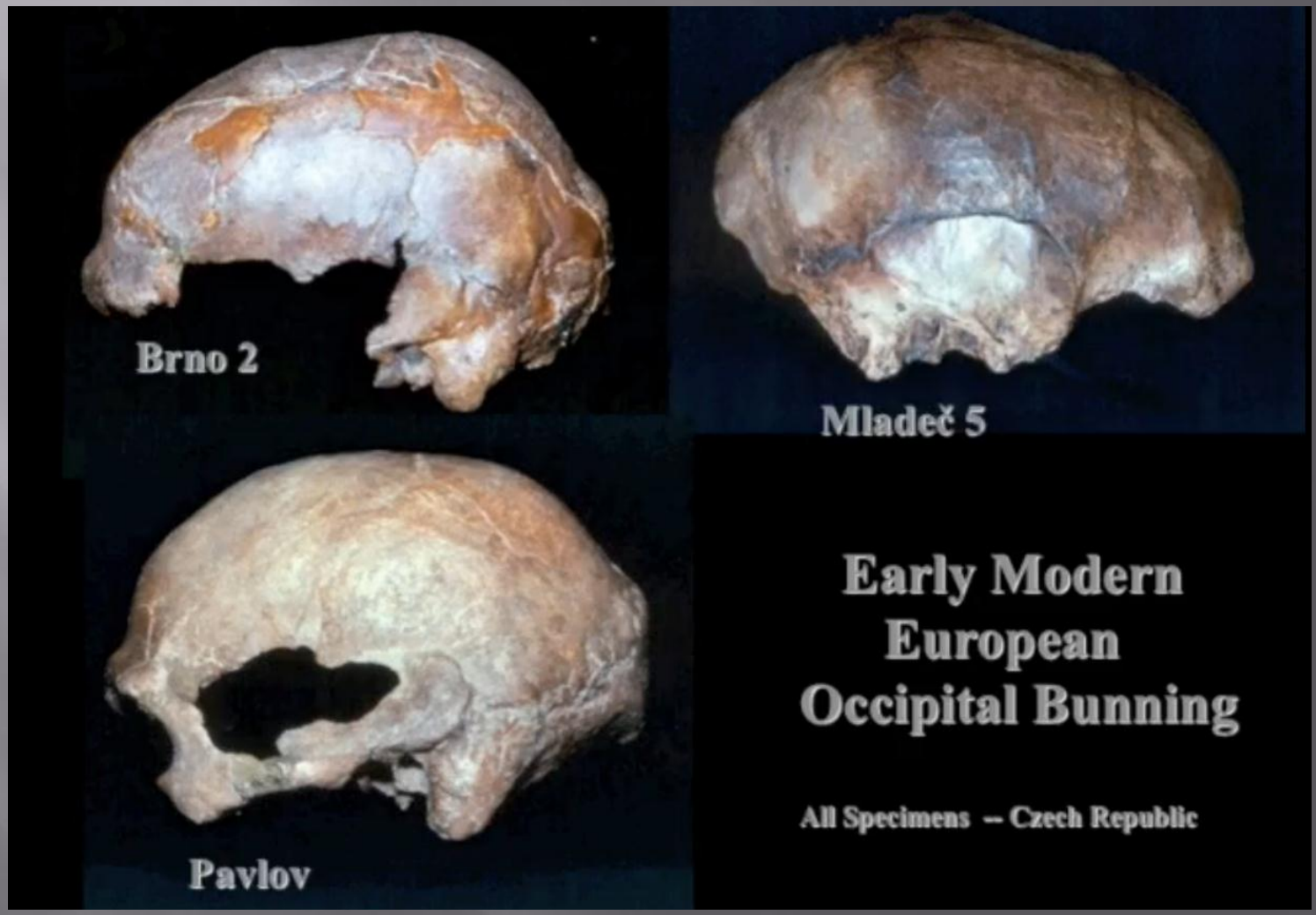
1859: Original

2000: associated Zygomaticomaxillary fragment

# Neanderthal Occipital Bunning is brain driven


Endocast

# Early Moderns had Occipital Bunning from N admixture



# Robert Andrew Foley (1953-): Two wave immigration & ecological effects

- British evolutionary biologist
- Professor of Human Evolution at the University of Cambridge
- Foley is the leader of the Cambridge school in evolutionary biology which argues, for two waves of Out of Africa migrations by *Homo sapiens*; first one circa 85K (before Toba eruption at 74K)
- The competing Oxford school, championed by Stephen Oppenheimer, holds that there was just one migration across the *Bab-el-Mandeb* strait at the end of the Red Sea, at 60K.
- Major figure in impact of ecology and energy expenditure on hominid evolution

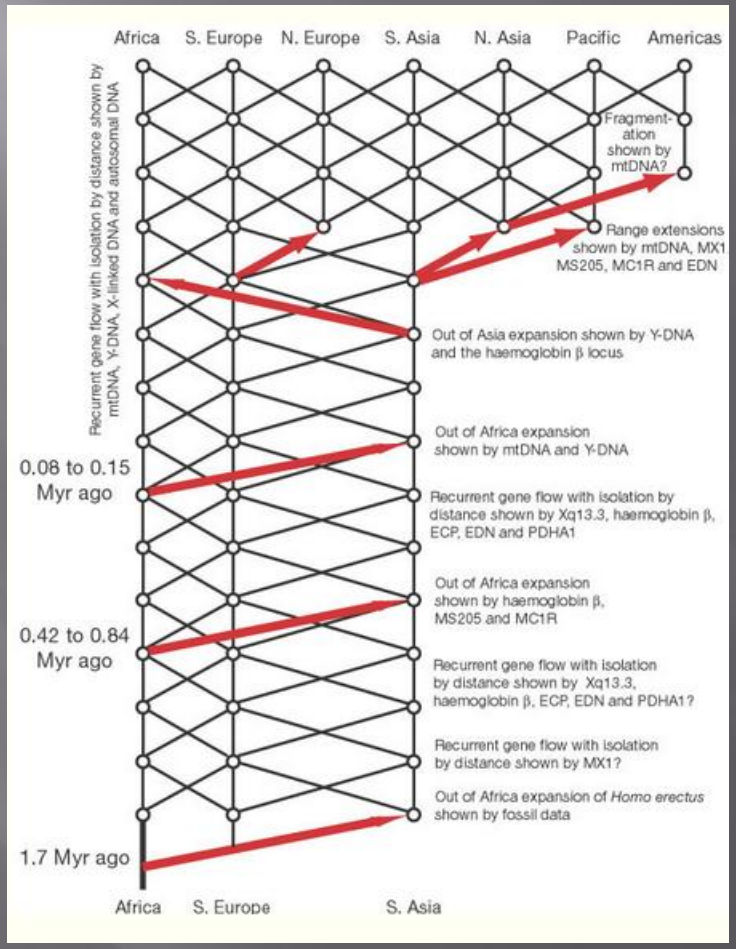
# Marta Mirazon Lahr: Two wave immigration & ecological effects

- Biological anthropologist
- Department of Biological Anthropology, Univ. of Cambridge
- Specialist in human diversity, effects of climate & geography on human evolution
- Two wave dispersal theory (with husband Robert Foley)

# Alan Templeton: Out of Africa again and again

- American geneticist and statistician from Washington University in St. Louis
- 2002: published a genetic study in *Nature* entitled "*Out of Africa again and again*," contradicting the simple replacement theory of *Homo erectus* and Neanderthals by modern humans.
- Using ten different haplotype trees, shows that following an initial exodus from Africa of Homo erectus at about 1.7 million years, there were at least two subsequent major expansions out of Africa, one at .84-.42 myr, the second at .15 to .08 myr.
- The genetic data also shows ubiquity of genetic interchange or interbreeding between human populations throughout the 1.7 myr, which appears to refute the recent out-of Africa replacement theory.

# "Out of Africa again and again"



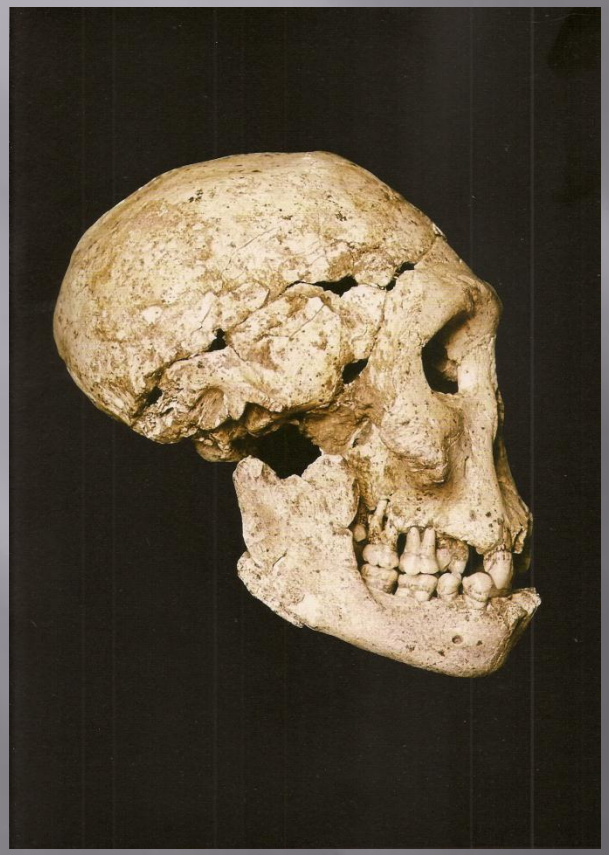
# David O. Lordkipanidze (1963-): *Homo erectus* at Dmanisi, Georgia

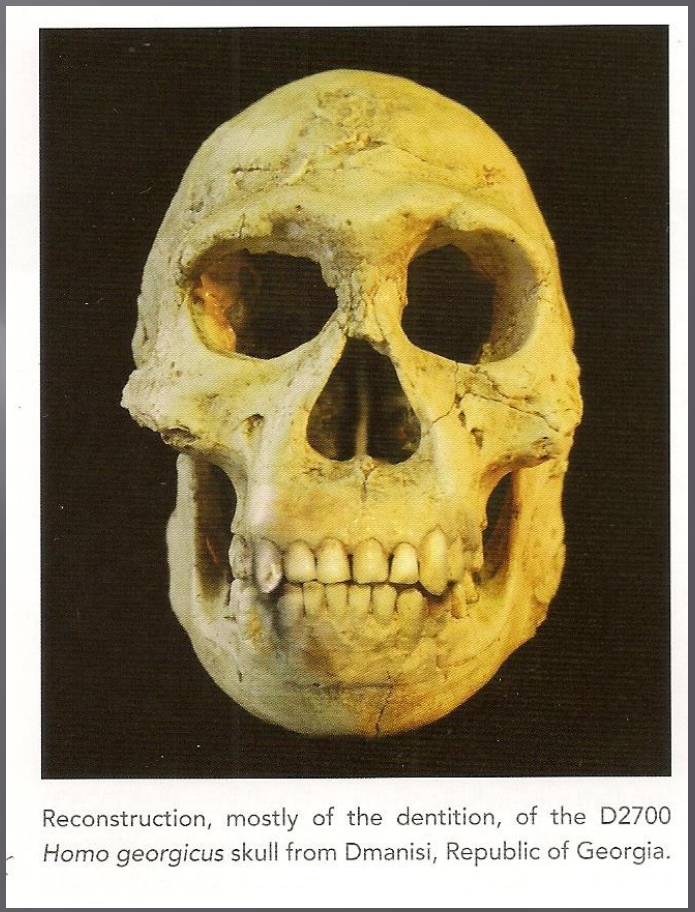
- **Georgian** anthropologist and archaeologist, Professor, Georgian National Academy of Sciences.
- 1991-2005: discovered the hominin fossil, first named *Homo georgicus*, but later reclassified as *Homo erectus*; at Dmanisi, Georgia; skull & 4 skeletons; 1.8 M

- It is the earliest known hominid site outside of Africa.

- Gabunia, Leo; Vekua, Abesalom; Lordkipanidze, David et al. "Earliest Pleistocene Hominid Cranial Remains from Dmanisi, Republic of Georgia: Taxonomy, Geological Setting, and Age". *Science* 12 May 2000: Vol. 288 no. 5468 pp. 1019-1025.

# Dmanisi, Georgia: *Homo georgicus (erectus)*





Reconstruction, mostly of the dentition, of the D2700 *Homo georgicus* skull from Dmanisi, Republic of Georgia.

Homo georgicus, D 2600

# Martin Pickford (1943-): *Orrorin tugenensis*

- English paleoanthropologist
- Chair in Paleoanthropology and Prehistory at the Collège de France and researcher at the Département Histoire de la Terre in the Muséum national d'Histoire.
- 2000: with Brigette Senut, in Tugen Hills, Kenya, discovered *Orrorin tugenensis;* 6-5 M

- Senut, B., Pickford, M., Gommery, D., Mein, P., Cheboi, K., & Coppens, Y. (January 20, 2001). First hominid from the Miocene (Lukeino Formation, Kenya). Comptes Rendus Academie Des Sciences Paris Serie 2 Sciences De La Terre Et Des Planetes Fascicule A, 332, 137-144.

# Brigette Senut (1954-): *Orrorin tugenensis*

- French paleontologist
- Professor of Paleontology in the Department of Earth History National Museum of Natural History
- 2000: with Martin Pickford, in Tugen Hills, Kenya, discovered *Orrorin tugenensis*

# 2000: *Orrorin tugenensis*
# 6 MYA - Earliest bipedality?

Orrorin tugenensis
BAR 1000'00

Discoverer:
Kiptalam Cheboi

Locality: Tugen Hills,
Kenya

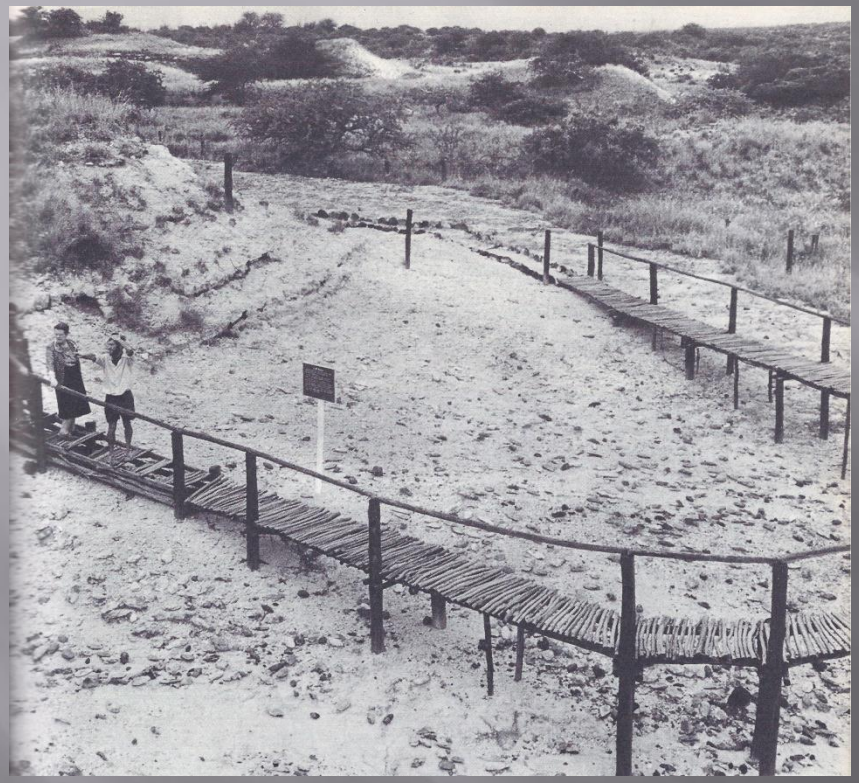
Date: 2000

Age: 6 M

# Glynn Llywellyn Isaac (1937-1985): Social Networks & Koobi Fora Research Project

- South African archeologist
- Professor of anthropology, UC Berkeley & Harvard
- Behavioral interpretation s of Paleolithic record: effect of social networks, gathering, meat eating and other factors on human evolution; focused on a "home base" and the importance of sexual division of labor on hominid social organization.
- Excavations at Olorgesailie, Peninj, & Lake Turkana, Kenya
- Co-director of Koobi Fora Research Project at East Turkana, with R. Leakey
- *Olorgesailie: Archaeological Studies of a Middle Pleistocene Lake Basin in Kenya*(1977); *Koobi Fora Research Project, Volume 5: Plio-Pleistocene Archaeology* (1997).

# Olorgesailie, Kenya



Handaxes

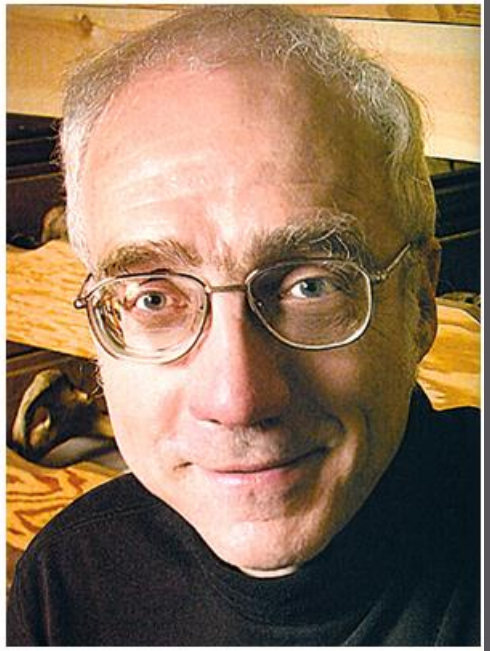
*Homo erectus*

# Richard G. Klein (1941-):
## Animal bone analysis & 50K Revolution

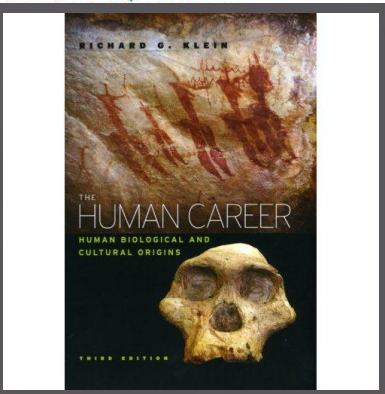
- American Paleoanthropologist
- Professor of Biology and Anthropology at Stanford University
- Student of F. Clark Howell & François Bordes
- He has pioneered the analysis of animal bones in understanding human culture.
- 1984: coauthored *The Analysis of Animal Bones from Archaeological Sites*
- Revolution at 50K: First Eland antelope then buffalo at 50K = use of projectiles; coastal shellfish collection
- His primary thesis is that modern humans evolved in East Africa some 100 K ago and, starting 50,000 years ago, began spreading throughout the non-African world, replacing archaic human populations over time.

- Modern behavior arose suddenly in the Upper Paleolithic revolution around 50,000 years ago due to genetic mutation in brain organization

- 2009: *The Human Career: Human Biological and Cultural Origins*, 3rd ed.

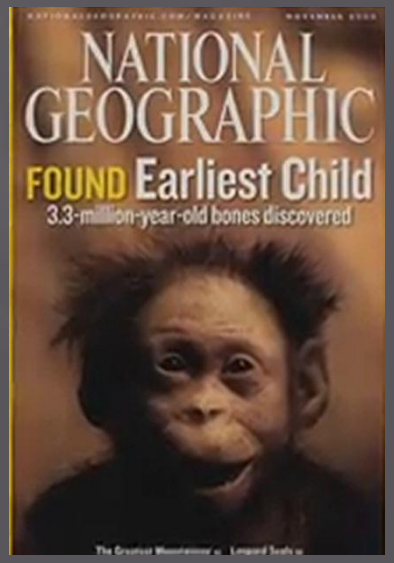


Klarreich E PNAS 2004;101:5705-5707

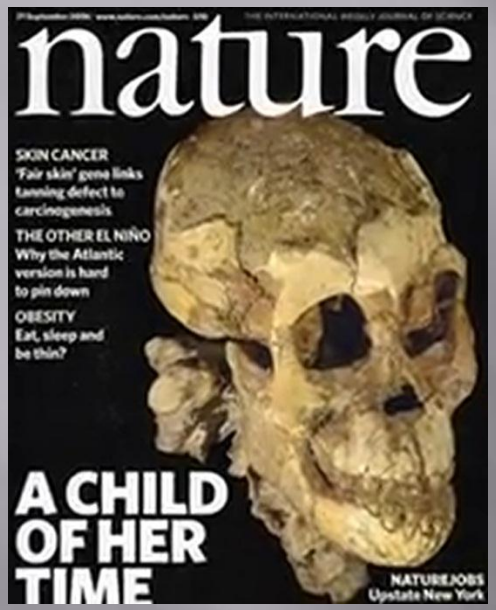


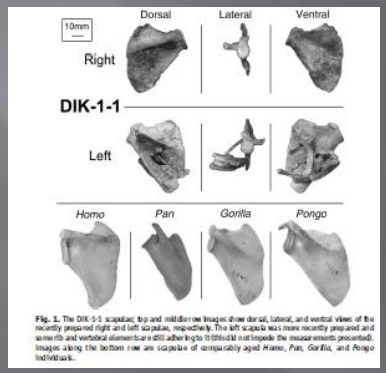
# Zeresenay Alemseged (1969-): Dikika A. afarensis child, Selam

- Ethiopian paleontologist; curator and chair of anthropology at the California Academy of Sciences
- Director, Dikika Research Project (DRP), Afar, Ethiopia.
- 2006: at Dikika, Ethiopia, discovered an *Australopithecus afarensis* child (Selam), 3.3 M
- **Alemseged**, Z., Spoor, F., Kimbel, W.H., Bobe, R., Geraads, D., Reed, D., Wynn, J.G. A juvenile early hominin skeleton from Dikika, Ethiopia. Nature 443:296-301.



# 2006: *A. Afarensis*, Dikika, Selam




2011: Shoulders

# Louise N. Leakey (1972-): *Kenyanthropus platyops*

- Kenyan paleontologist
- Daughter of Richard and Maeve Leakey
- Field expedition leader for Turkana paleontological expeditions; together with Meave Leakey, she leads the Koobi Fora research project
- 1977: at the age of six, when she became the youngest person to find hominid fossils
- 2001, with Maeve Leakey, discovered *Kenyanthropus platyops*
- 2007: KNM-ER 42700 calvaria/H. erectus and KNM-ER 42703 partial maxilla/H. Habilis; 2 taxa at same time

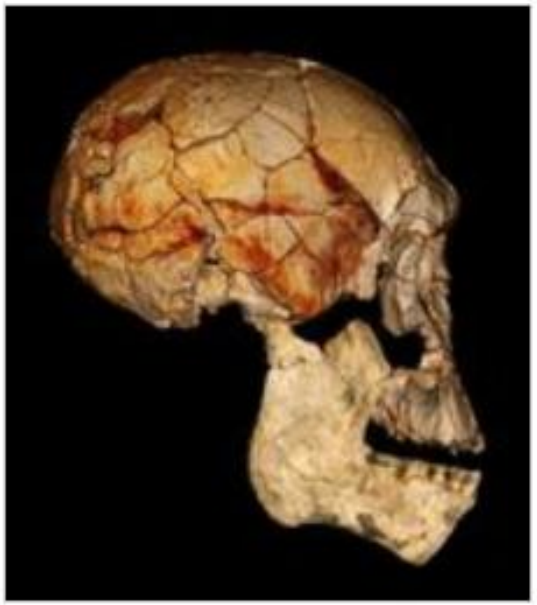
# Fred Spoor:

## *Kenyanthropus platyops*, Dikika Child, KNM-ER 62000

- Paleoanthropologist
- Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology; Univ. College of London; affiliated with the Koobi Fora Research Project
- 2001: With Maeve Leakey, named KNM-WT40000, the type specimen *Kenyanthropus platyops*.
- 2006: With Z.Alemseged, description of A. Afarensis child from Dikika
- 2012: With Maeve Leakey, Lake Turkana 2M yo jaw and face (KNM-ER 62000) of new *Homo* species (possible match of KNM-ER 1470); species different from *H. habilis;* Tim White disagrees
- Multiple lineages of early *Homo* are present in the record at Koobi Fora.

# Maeve Leakey & Fred Spoor: 2012 (KNM-ER 60000) jawbone with KNM-ER1470 cranium

Kenya's Lake Turkana between 2007 and 2009



*A composite image pairs a newfound jawbone (see above) with a 1470 cranium found in 1972. Illustration courtesy Fred Spoor.*

1.78-2.0M: 6 miles from 1972
***Homo rudolfensis*** skull,

# Louise Leakey

Image Credit: James Di Loreto, & Donald H. Hurlbert, Smithsonian Institution

*Kenyanthropus platyops*

Homo erectus crania:
OH 9 (large), and
KNM-ER 42700 (small)

# Peter Brown: *Homo floresiensis*

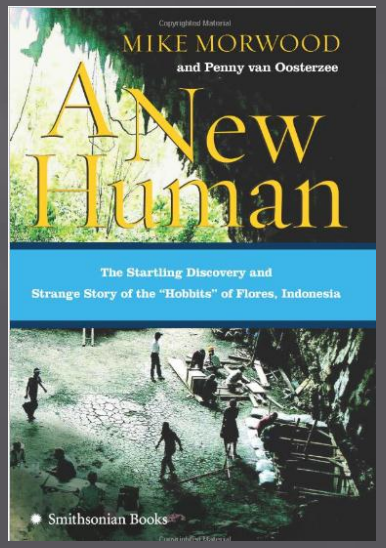
- Australian paleontologist
- University of New England, Armidale, Australia
- Expert on Australian and Asian fossils
- 2003: on the island of Flores, Indonesia, discovered *Homo floresiensis*

- 2004: A new small-bodied hominin from the Late Pleistocene of Flores, Indonesia, P. Brown, et al., *Nature*

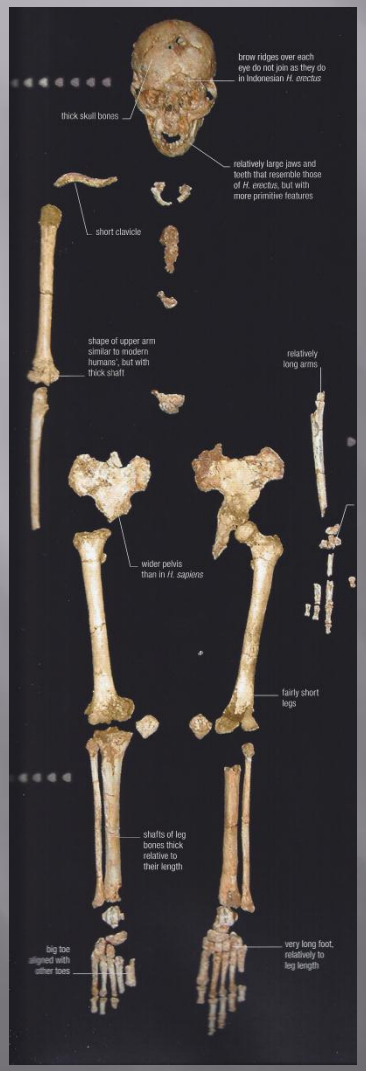
# Michael Morwood: *Homo floresiensis*

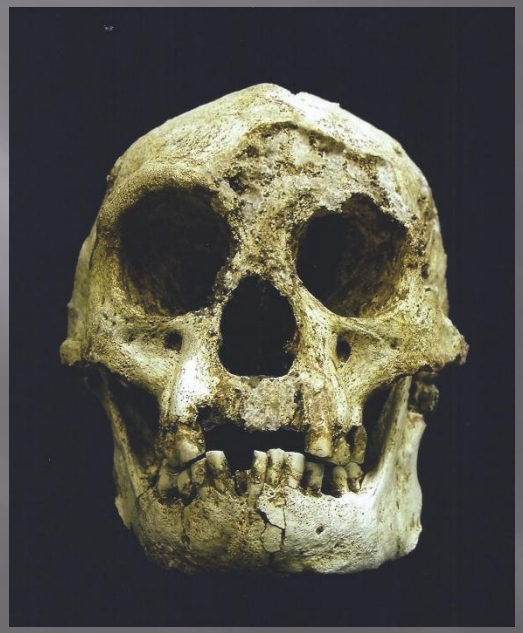
- Archeologist
- Professor in Archeology, School of Earth and Environmental Sciences, University of Wollongong, Australia

- 2003: Liang Bua Cave, Flores, Indonesia, *Homo floresensis*



# 2003: Homo floresiensis, 417cc

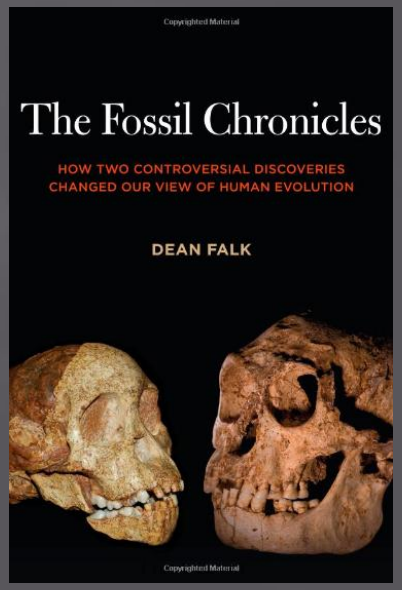


*Homo floresiensis*
(LB1, type, partial skeleton)
Discoverer: Thomas Sutikna
Locality: Liang Bua, Flores, Indonesia
Date: 2003
Age: 18K

# Dean Falk (1944-): Hominid brain evolution & MRI use

- American anthropologist
- Professor and chair of the Department of Anthropology, Florida State University
- Specializes in the evolution of the brain and cognition in higher primates.
- A pioneer in the use of magnetic resonance imaging to study hominid skulls
- Long academic feud with Holloway over lunate sulcus
- 1990: Radiator theory of brain evolution (network of veins in the lineage leading to *Homo* acted as a radiator that released a thermal constraint on brain size)
- 2005: supported the claim that the *Homo floresiensis* represented a new species, closely related to Homo erectus. Not pathological microencephalic.
- Author: *The Fossil Chronicles*

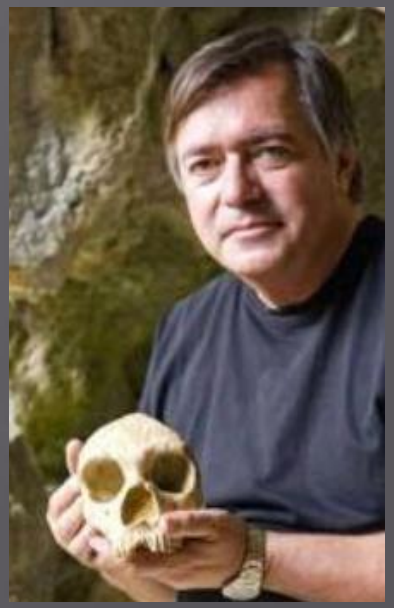


# Teuku Jacob (1929-2007): Indonesian paleoanthropology

- Indonesia's "king of paleoanthropology"
- Studied fossil hominids under famed paleontologist G. H. R. von Koenigswald, then found and was curator of many important specimens, particularly of *Homo erectus*
- Skeptic of the 1-meter-tall "hobbit" remains from the Indonesian island of Flores
- In 2004, Jacob removed most of the remains from Soejono's institution, Jakarta's National Research Centre of Archaeology, for his own research without the permission of the Centre's directors. Returned them, with portions severely damaged & 2 missing leg bones.

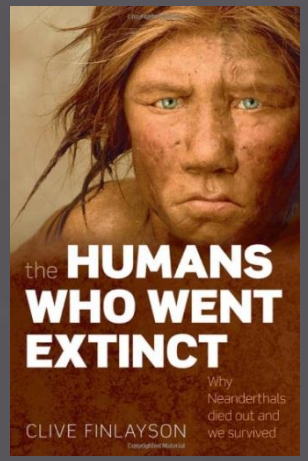
CREDIT: ANNAMARIA TALAS/REAL PICTURES

# Clive Finlayson: Defender of Neanderthal Abilities



- English paleontologist
- Director, Heritage Division, Gibraltar Museum
- Co-director (with C.B.Stringer, J. Rodriguez Vidal and F.Giles Pacheco) of the Gibraltar Caves Research Project 1991-present

- Gorham's Cave, Gibraltar, which has been claimed to contain the most recent Mousterian assemblages known to date (Finlayson et al. 2006)
- Author: *Humans who went extinct*



# Neanderthals & Corvid feathers

Clive Finlayson models griffon plumage. The ulna was removed from the carcass with a flint tool and the feathers left intact. Most of the birds Neandertals used were smaller and thus perhaps better suited to headdresses. Image: Kate Wong

2012 *PLOS ONE study:* 1699 fossil sites in Eurasia and north Africa spanning the Pleistocene epoch. Neandertals across western Eurasia were strongly associated with corvids and raptors (vultures and their relatives)—more so than were the anatomically modern humans who succeeded them.


Bonelli's eagle is one of the raptor species Neandertals hunted, presumably for its dark feathers. Image: Clive Finlayson

# Last 4 Neandertal Strongholds


- Last populations of Neanderthals were concentrated in four strongholds
- (1-4 in order of importance). The south of Iberia stands out as the largest stronghold and it is within this area that the last Neanderthals survived.

# Anatoly Derevianko and Michail Shunkov: Denisovans – X woman

- Anatoly Derevianko and Michail Shunkov of the Institute of Archaeology and Ethnology of Novosibirsk of the Russian Academy of Sciences ,

- 2000 & 2008: working at the site of Denisova Cave in the Altai Mountains of Siberia, discovered in 2000, a huge adult molar and in 2008 uncovered a small bone fragment from the fifth finger of a juvenile hominin, dubbed the "X woman"
- They are multiregionalists
- Krause et al. 2010: When the mitochondrial DNA of the bone was sequenced in May 2010 however, it belonged neither to a Neandertal nor to a modern human: brown eyes, hair & skin

# Denisovans

**FIGURE B** A third molar from Denisova differs anatomically from Neandertals and modern humans and has similar DNA to the finger bone.


A Denisovan molar, one of the three sources of DNA for the high-coverage genome sequencing. (Max Planck Institute for Evolutionary Anthropology)


Replica of the Denisovan finger bone and a U.S. penny.
[Image courtesy of Max Planck Institute for Evolutionary Anthropology]

# Maria Mednikova: Denisovan toe bone

- Russian Academy of Science, Moscow
- Denisovan toe bone, 40K
- Found in same layer as finger, but distinct from it

# Matthias Krings:
## DNA Sequencing of Neanderthals

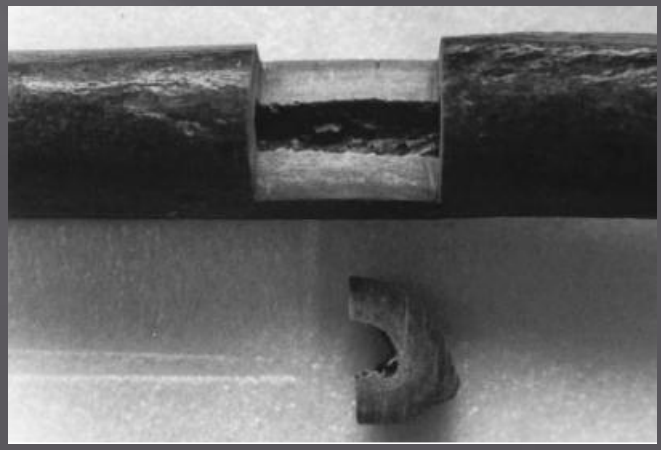
- University of Munich

- 1997: First Neandertal mitochondrial DNA sequenced (~400 bases) from Feldhofer Neanderthal, 40K;

- Proved modern humans and Neandertals are different species, which diverged from humans 690-550K ago

- 1997: Krings *et al.*, Neandertal DNA Sequences and the Origin of Modern Humans, *Cell* **90**, 19 (1997).

- 2000: Second mtDNA analysis of a Neandertal (from 29,000-year-old archaeological bone material of a Neanderthal recovered from the Mezmaiskaya Cave in the northern Caucasus): Ovchinnikov *et al.*, *Nature* **404**, 490 (2000).



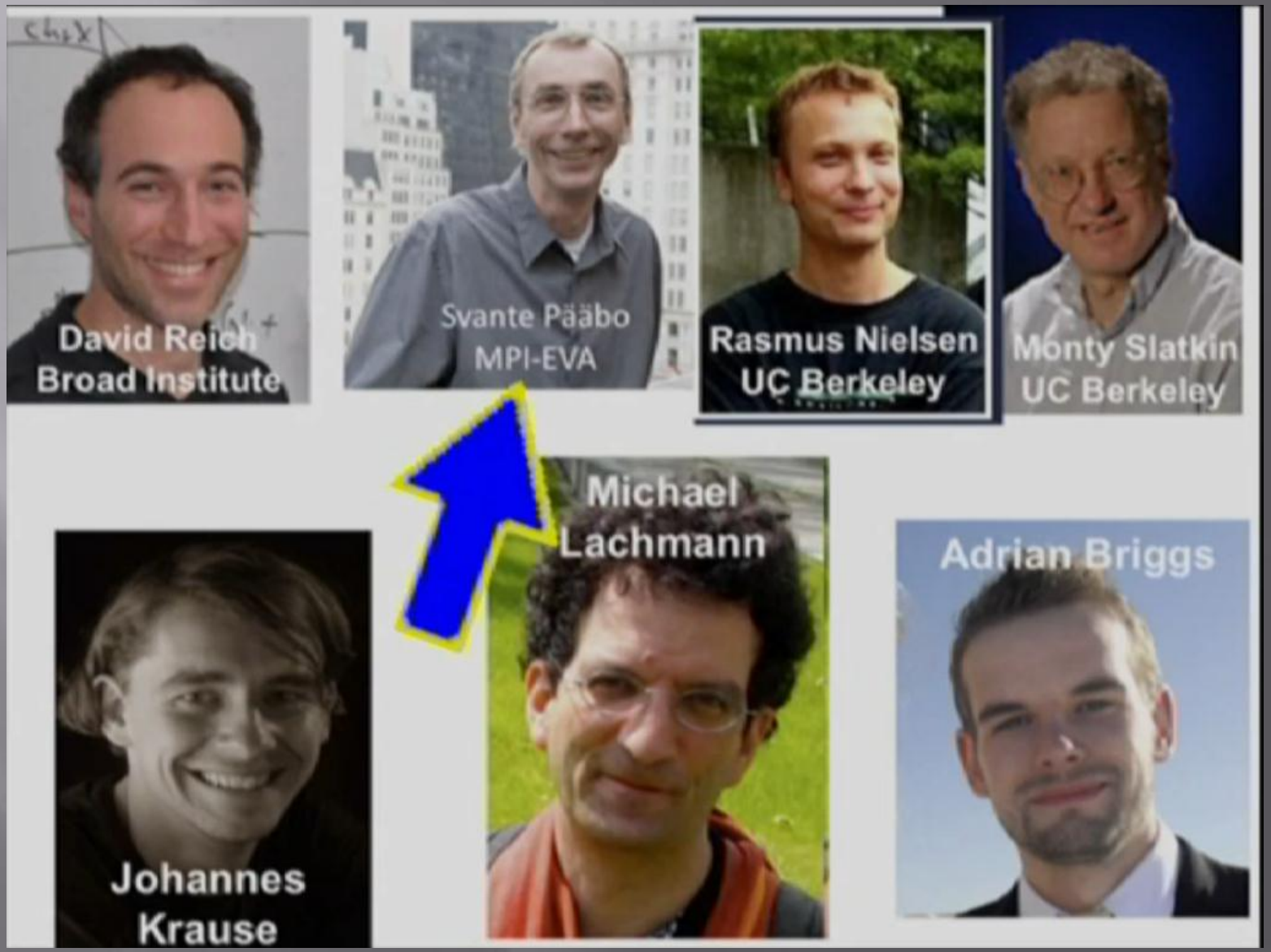
# Paleogenetic Studies

- 2006: Partial sequencing of Neandertal genomic DNA (Noonan *et al.*, *Science* **314**, 1113 (2006). Green *et al.*, *Nature* **444**, 330 (2006))
- 2007: Neandertals roamed as far as Siberia (Krause *et al.*, *Nature* **449**, 902 (2007))
- 2007: Neandertals found to have red hair and fair skin (Lalueza-Fox *et al.*, *Science* **318**, 1453 (2007))
- 2007: Neandertals and modern humans share the same variant of the language gene FOXP2 (Krause *et al.*, *Curr. Biology* **17**, 1908 (2007)
- Neandertals found with type O blood (Lalueza-Fox *et al.*, *BMC Evol. Biol.* **8**, 342 (2008))

# Paleogenetic Studies 2

- 2008: Complete mitochondrial Neandertal genome sequenced (Green *et al.*, *Cell* **134**, 416 (2008))
- 2009: Retrieval and analysis of five Neandertal mtDNA genomes (Briggs *et al.*, *Science* **325**, 318 (2009))
- 2010: At least 3 subgroups of Neandertals lived in western Europe, southern Europe, and western Asia (Fabre *et al.*, *PLoS ONE* **4**, e5151. doi:10.1371/journal.pone.0005151 (2010))
- 2010: Draft sequence of the Neandertal genome (Green *et al.*, *Science* **328**, 710 (2010))
- 2012: Full sequence of the Denisovian genome ( Matthias Meyer, et al., A High-Coverage Genome Sequence from an Archaic Denisovian Individual *Science* (30 August 2012)

# Paleogenetics gang

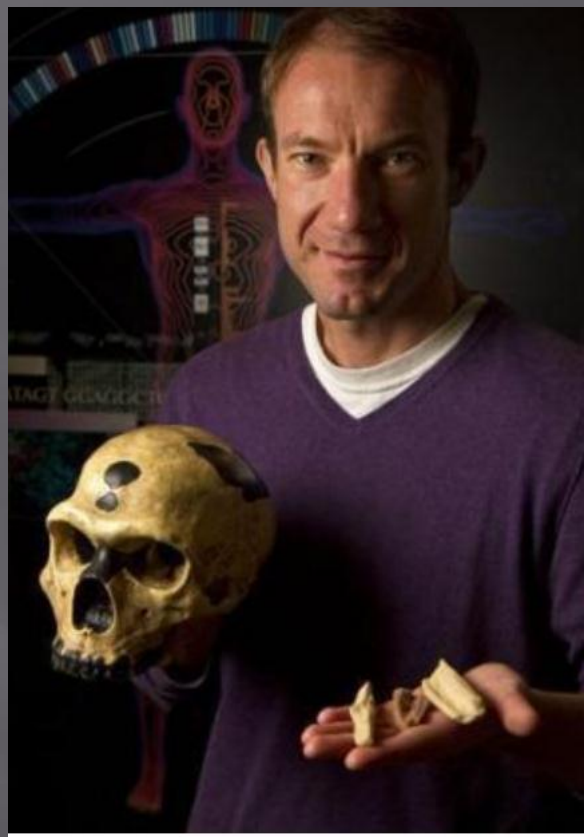


# Svante Paabo (1955-): Evolutionary Genetics

- Swedish biologist specializing in evolutionary genetics
- Student of Allan Wilson
- Director of genetics at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany)
- A leader in the field of molecular evolution & one of the founders of paleogenetics, studying FOX2 gene, ancient DNA from mammoths, the giant sloth, Neanderthals, & Denisovians.
- 1997: retrieve DNA from Feldhofer Cave Neanderthal; N = different species

# Richard Edward Green: 1-4% Neandertal DNA in modern humans

- Computational biologist; UC Santa Cruz
- Student of Svante Paabo
- 2010: proved gene flow from Neanderthals to modern humans between 50-80K ago
- Directs the Neanderthal Genome Project
- 2010: Found 1 to 4 % of the genomes of non-Africans is derived from Neanderthals, meaning that the admixture occurred early on, probably in the Middle East; data from 3 female bones from Vindiga Cave, Croatia, 38-44 K; from 3.5% of DNA; 95% was bacterial
- Green *et al.*, *Science* **328**, 710 (2010)

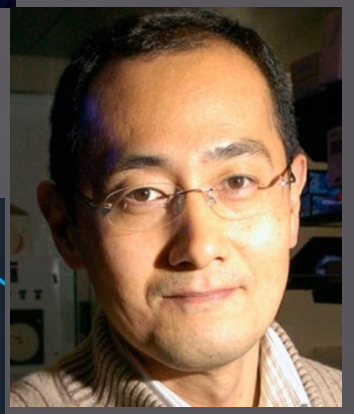


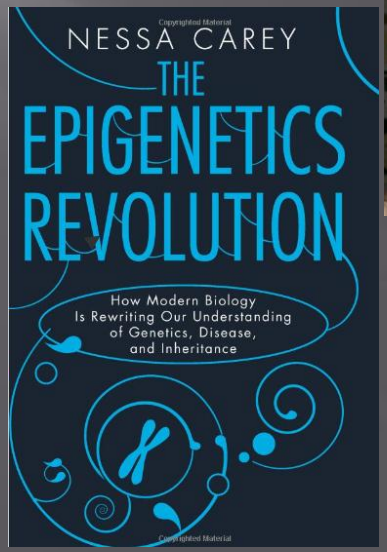
*Richard E. (Ed) Green, a computational biologist in the Baskin School of Engineering at UC Santa*

# Epigenetics: Sir John Gurdon & Shinya Yamanaka

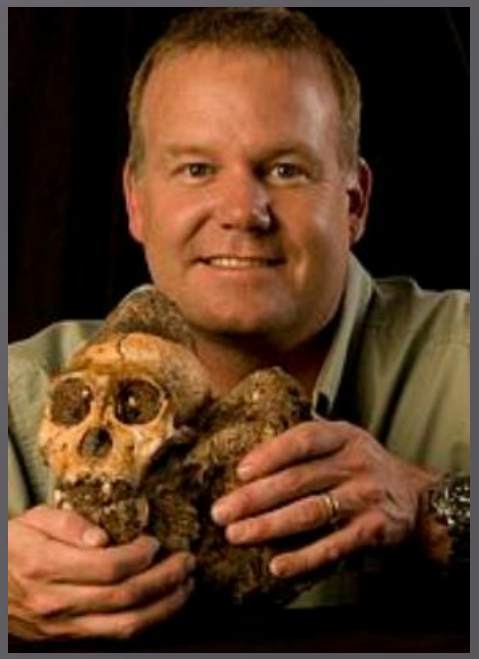
- 2012 Nobel in Medicine for discovery that mature cells can be converted to stem cells.
- **Basis of Epigenetics**
- 1958: John Gurdon successfully cloned a frog using nuclear transplantation
- 2007: Shinya Yamanaka generated induced **pluripotent stem cells** (iPS cells) from mature adult cells using 4 "Yamanaka" transcription factors

- **Epigenetics: Lamarckian?**



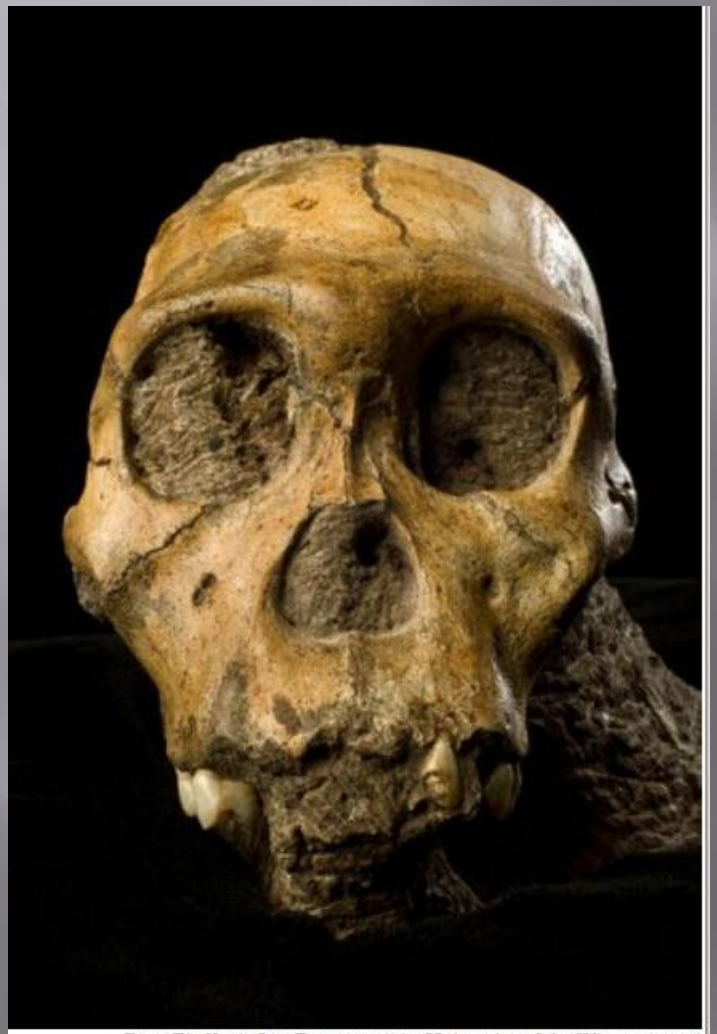


# Lee Rogers Berger (1965-):
## *Australopithecus sediba* & Taung Bird of Prey Hypothesis.

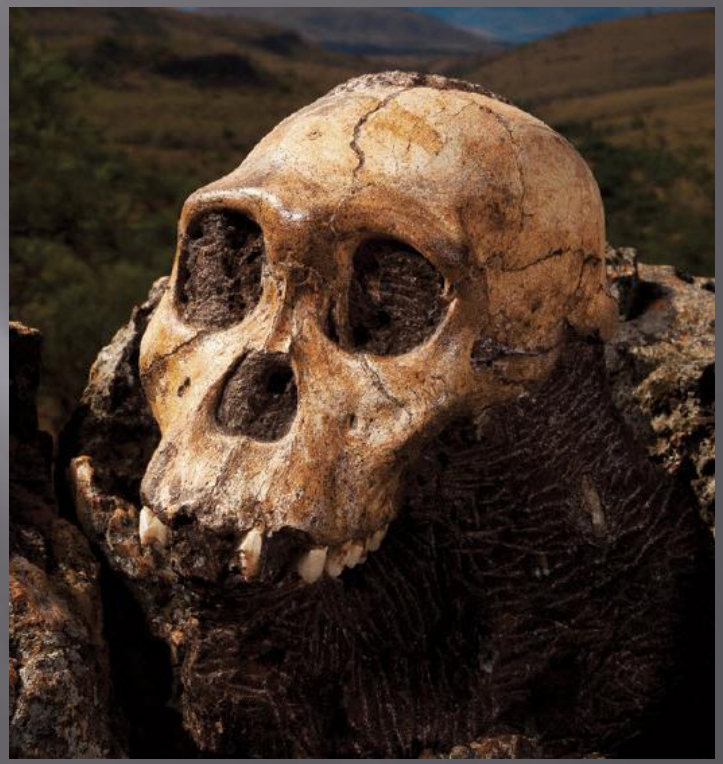


- American paleoanthropologist, physical anthropologist and archeologist
- University of the Witwatersrand
- Surveying South Africa's Malapa Cave
- 2008: son Matthew discovers *Australopithecus sediba*, 1.98M
- Work on *Australopithecus africanus* body proportions and the Taung Bird of Prey Hypothesis.

# 2008: *Australopithecus sediba*



Brett Eloff, via Lee Berger and the University of the Witwatersrand



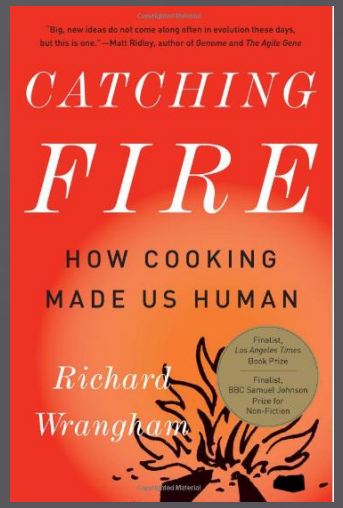
*Australopithecus sediba*
(LH1, type, cranium)
Discoverer: Matthew Berger
Locality: Malapa Cave, South Africa
Date:2008
Age: 1.98 M

# Leslie Aiello: Expensive Tissue Hypothesis

- American evolutionary anthropologist
- President, *Wenner-Gren Foundation for Anthropological Research, Inc.* Emeritus Professor, *University College London*
- 1995: In collaboration with Peter Wheeler, she developed the Expensive Tissue Hypothesis which posited an inverse relationship between brain size and gut size mediated through the adoption of a high quality animal-based diet.

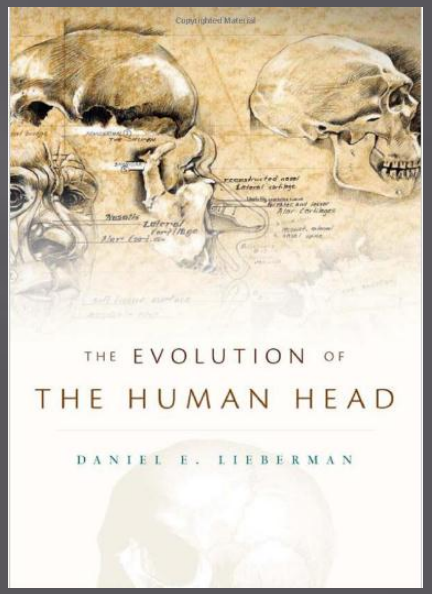
# Richard Wrangham: Cooking Made Us Human

- British primatologist, Prof. of Biological Anthropology, Harvard Univ.
- Co-director of the Kibale Chimpanzee Project: pioneer of the study of chimp self-medication
- Argues for the role cooking has played in human evolution. He has argued that cooking, esp. the consumption of cooked meat & tubers, might explain the increase in hominid brain sizes, smaller teeth and jaws, and decrease in sexual dimorphism about 1.8 M ago, in *Homo erectus*
- 2009: Book: Catching Fire: How Cooking Made Us Human
- Most disagree: Prefer the Expensive Tissue Hypothesis: prior to the advent of cooking, hominids turned to eating meats, which then caused the evolutionary shift to smaller guts and larger brains



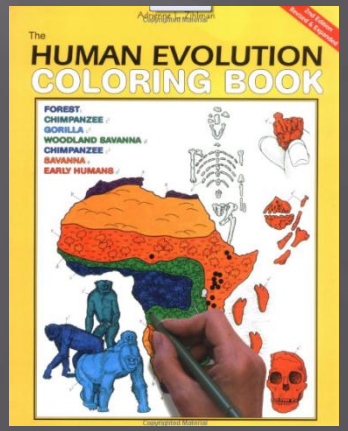
# Daniel E. Lieberman: Born to run & hunt

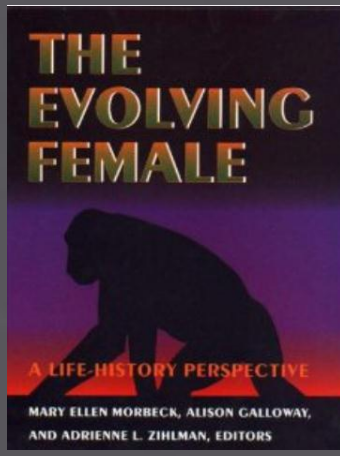
- Professor of Human Evolutionary Biology, Harvard University
- 2007: Born to run: The **endurance running hypothesis** is the theory that the evolution of certain human characteristics can be explained as adaptations to long-distance running, probably for the purpose of persistence hunting. The hypothesis that hunting was the main subsistence form for early hominins.
- Lieberman, Daniel E., Dennis M. Bramble, David A. Raichlen, and John J. Shea. 2007. The evolution of endurance running and the tyranny of ethnography: A reply to Pickering and Bunn (2007). Journal of Human Evolution 53(4): 439-442



# Adrienne Zihlman: Women in Hominid Evolution

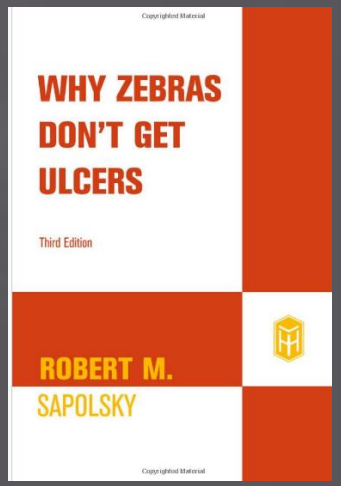
- American physical anthropologist
- Professor of Anthropology, University of California, Santa Cruz
- Specialist in primate physiology and development
- Role of women in evolution



# Robert Maurice Sapolsky (1957-): Primatology & Stress

- American neuroendocrinologist Professor of Biological Sciences, Professor of Neurology, Neurological Sciences and Neurosurgery, at Stanford University
- A specialist on baboons, stress, glucocorticoids



# Bibliography


- Tattersall, Ian – *Masters of the Planet*
- Tattersall, Ian – *The Fossil Trail*
- Reader, John – *Missing links (2nd Ed.)*
- Wood, Bernard – *Human Evolution (A Brief Insight)*
- Falk, Dean – *The Fossil Chronicles*
- Stringer, C. – *Lone Survivors*
- Tattersall, Ian & Schwartz, J. – *Extinct Humans*
- Johanson, D. & Maitland, E. - *Lucy: The Beginnings of Humankind*
- Johanson, Don & Edgar, B. – *From Lucy to Language, 2nd Ed.*
- Finlayson, C. – *The Humans Who Went Extinct*
- Klein, Richard – *The Human Career, 3rd Ed.* (Definitive textbook

# Downloads

- Charlie's website: charlesjvellaphd.com
- Dropbox invitation: Collection of scanned images from dozens of hominid evolution books; great collection of classic skulls: send me your email
- charlesvella@comcast.net