

# A BRIEF BIOGRAPHIC AND HISTORICAL REVIEW OF PALEOANTHROPOLOGY PART II

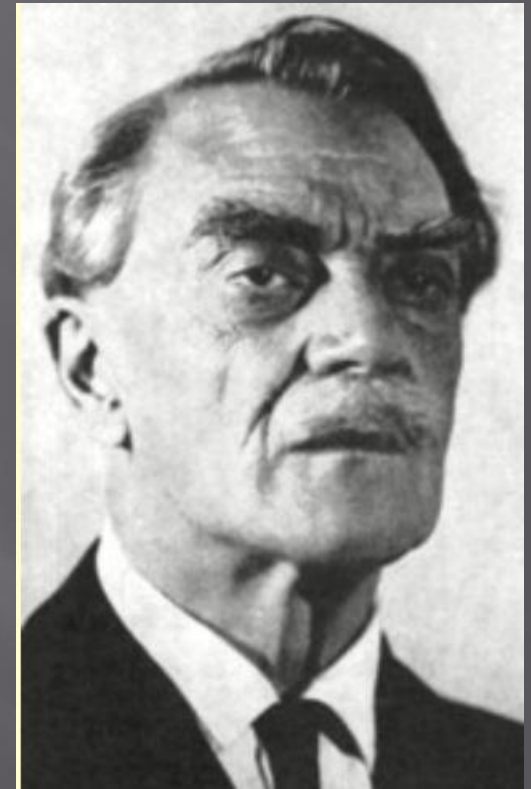
Charles J. Vella  
Oct. 17, 2012

Thanks to Erik Trinkaus, Pat Shipman, Ian Tattersall & Wikipedia, Steve Jones et al.,  
Don Johanson

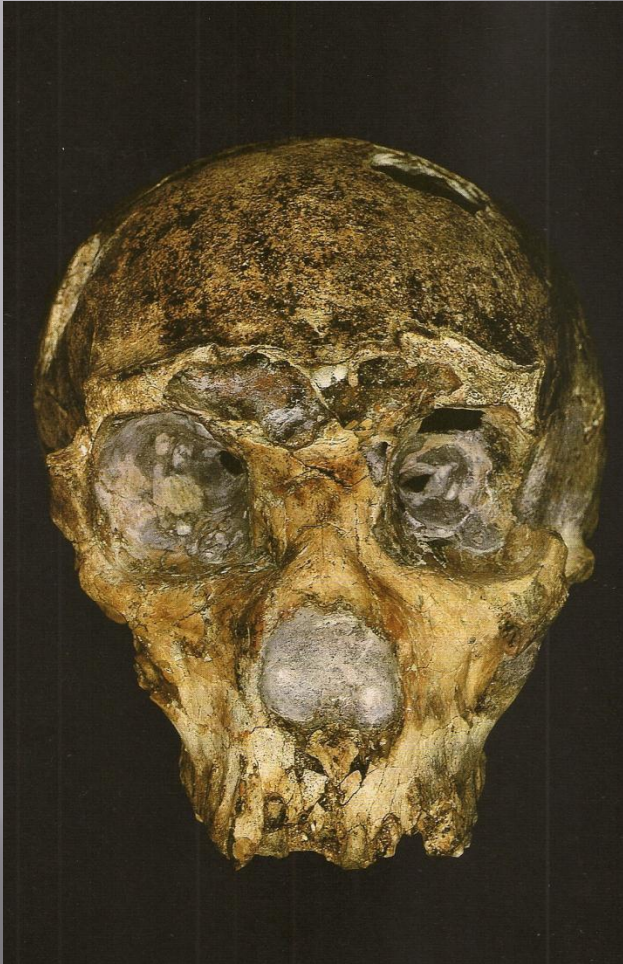
Many Photos: David Brill

# Sergio Sergi (1878–1972): Italian Neandertals

- ▣ Father of modern human paleoanthrology in Italy
- ▣ 1929: Studied the Saccopastore neanderthal, found by Mario Grazioli: partial Neandertal craniums at Saccopastore quarry at Rome, Italy; 80-120K
- ▣ Collaborated with Alberto Blanc on the Monte Circeo Neanderthal cranium



# 1929: *Homo Neandertalensis*, Saccopastore, Italy



*Homo neanderthalensis*

(Saccopastore 1)

Discoverer: Mario Grazioli

Locality: Saccopastore quarry, Rome, Italy

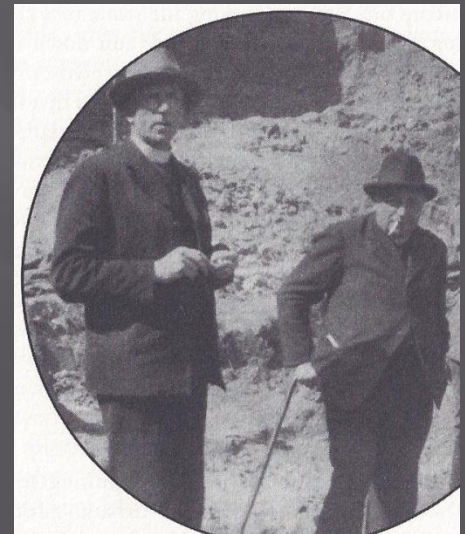
Date: 1929

Age: 120K



# Father Henri Breuil (1877–1961): Paleolithic cave art

- ▣ French Catholic priest, archaeologist, anthropologist, ethnologist and geologist
- ▣ Published many books and monographs, introducing the caves of Lascaux and Altamira to the general public
- ▣ 1935: Breuil visited the Peking Man excavations at Zhoukoudian, China and confirmed the presence of stone tools at the site. Proposed extensive bone tool use (disproved), and influenced controlled excavation & mapping.
- ▣ Authority on North African and European Stone Age art





# Caves of Lascaux and Altamira



*The Hall of Bulls*  
c. 17,000 BC  
Lascaux, France

*Altamira Bison*  
c. 15,000 BC  
Altamira, Spain



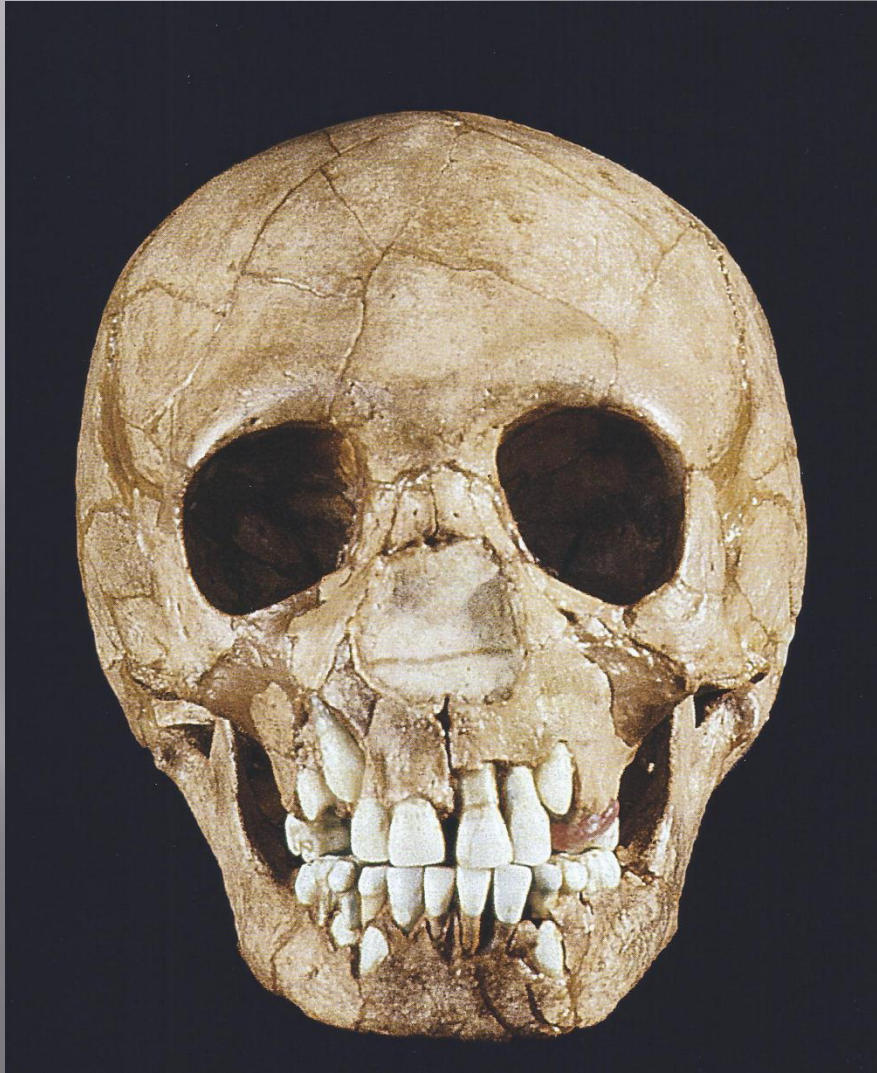
# Alexei Pavlovich Okladnikov (1908–1981): Teshik–Task Neandertal child

- ▣ Soviet archaeologist and ethnographer
- ▣ 1938: Discoverer of Teshik-Tash Neandertal child
- ▣ At the time, the farthest known easterly occurrence of Neanderthal male child at Bajsuntau, Uzbekistan





1938: Teshik-Tash Neandertal child,  
Bajsuntau, Uzbekistan



*Homo neanderthalensis*  
(Teshik-Tash)

Discoverer: Alexei Okladnikov

Locality: Teshik-Tash, Uzbekistan

Date: 1938

Age: 70K

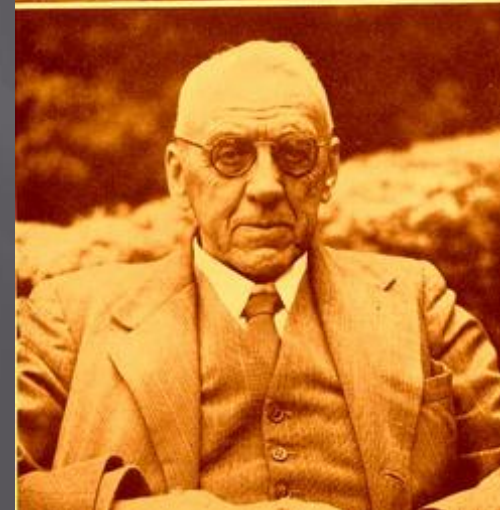


# Gert Terblanche

- ▣ 1938: A partial cranium and mandible of *Paranthropus robustus* was discovered by a schoolboy, Gert Terblanche, at Kromdraai (70 km south west of Pretoria) in South Africa.
- ▣ It was described as a new genus and species by Robert Broom of the Transvaal Museum.

# Robert Broom (1866–1951): Sterkfontein: *Australopithecus africanus*

- ▣ Scottish South African paleontologist
- ▣ Reputation for stealing & selling fossils
- ▣ First Supporter of Dart's interpretation of Taung Child
- ▣ 1936: excavation at Sterkfontein, discovered an endocranial cast (found by G. W. Barlow, lime works foreman); named *Australopithecus transvaalensis* (then *Plesianthropus transvaalensis*);
- ▣ First postcranial remains of *Australopithecus africanus*



# Robert Broom: Swartkrans & *Paranthropus robustus*

- ▣ 1947: With John T. Robinson, skull of *Australopithecus africanus*, STS 5 Ms. Ples
- ▣ 1948: first hip & thigh bones of *P. robustus* at Swartkrans
- ▣ Published 450 papers; but sold fossils in 1920s
- ▣ With Dart, changed human evolution theory by showing australopithecines were earliest hominids



Brain endocasts & cranium of *A. africanus*,  
S. Africa; brains less than 500 cc



1947: Sts 5, *A. transvaalensis*, then  
*Plesianthropus transvaalensis*,  
then *A. africanus*; Mrs. Ples (a male)



*Australopithecus africanus*  
(STS 5)

Discoverer: Robert Broom &  
John T. Robinson

Date: 1947

Locality: Sterfontein

Age 2.4 M



1947: *Australopithecus africanus*, STS 14:  
More human than apelike postcranially



*Australopithecus africanus*  
(STS 14)

Discoverer: Robert Broom &  
John T. Robinson

Date: 1947

Locality: Sterfontein

Age 2.5 M



# 1938: *Paranthropus robustus*, Swartkrans; 1<sup>st</sup> robust discovered



*Paranthropus robustus*  
(TM 1517)

Discoverer: Gert Terblanche

Date: 1938

Locality: Kromdraai, S. Africa

Age 2 M

# *Paranthropus robustus*, SK 48



# John Talbot Robinson (1923 - 2001): Mrs. Ples & *Homo ergaster*

- ▣ South African hominid paleontologist
- ▣ Professor at University of the Witwatersrand, and the University of Wisconsin–Madison
- ▣ Excavations, with Robert Broom, at the caves of Sterkfontein, Kromdraai and Swartkrans.
- ▣ 1947: His most famous discovery (with Robert Broom) was the nearly complete fossil skull of an *Australopithecus africanus*, known as Mrs. Ples.
- ▣ 1949: First discovered a mandible of a new hominid in southern Africa in 1949; he named the species *Telanthropus capensis*, now recognized as a member of *Homo ergaster*.



John T. Robinson. Courtesy of the University of the Witwatersrand.

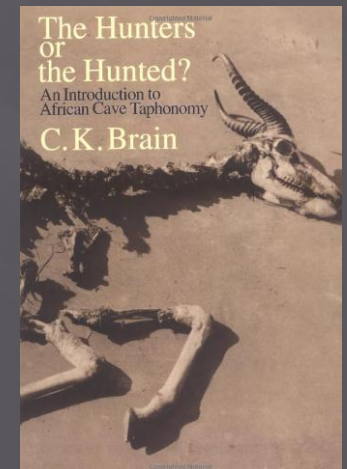


1949: SK15, *Telanthropus capensis*  
(now *Homo ergaster*)



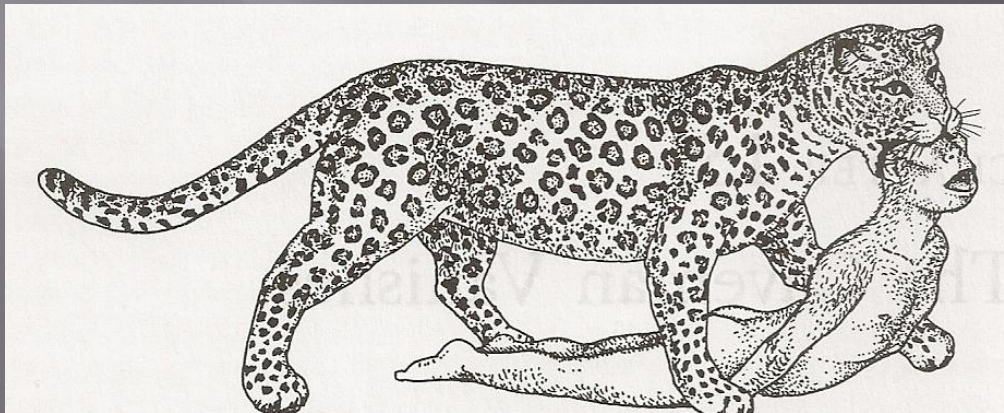
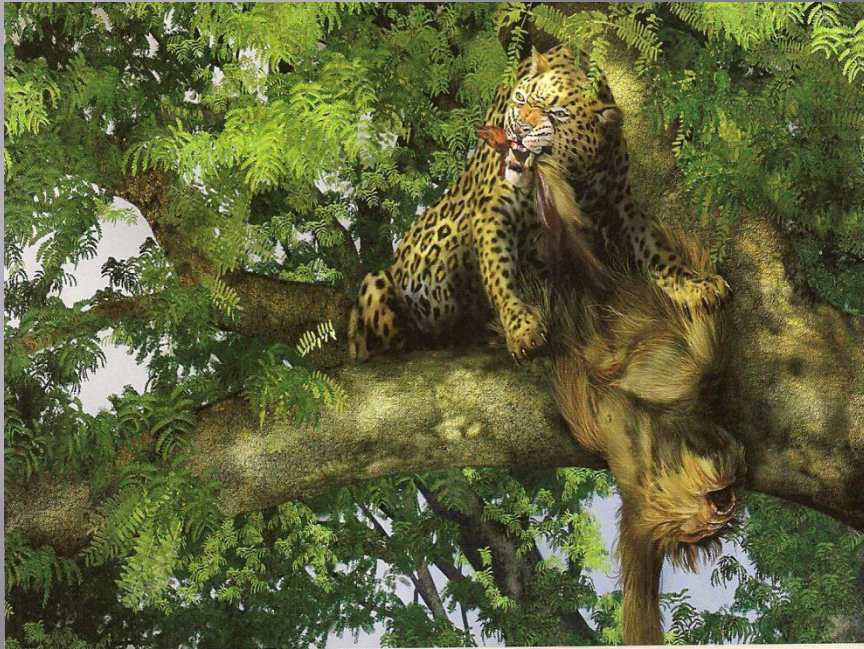
# Charles Kimberlin (Bob) Brain (1931 - ): Swartkrans taphonomy & Predation theory

- ❑ South African paleontologist
- ❑ Directed the Transvaal Museum
- ❑ Founder of the science of taphonomy (remains of creatures at the site of death)
- ❑ Supervised 30 year long excavation of the Swartkrans Cave in the Sterkfontein Valley; did the only comprehensive geological survey of all five australopithecine sites of South Africa
- ❑ Discovered Acheulean handaxes at Sterkfontein
- ❑ 1983: Realized most fossil assemblages in the Cradle of Humankind resulted from the accumulation of bones by predators and scavengers. Emphasized importance of predation in hominid history: until recently, we were the hunted.





# Hominid Predation at Swartkans, S. Africa



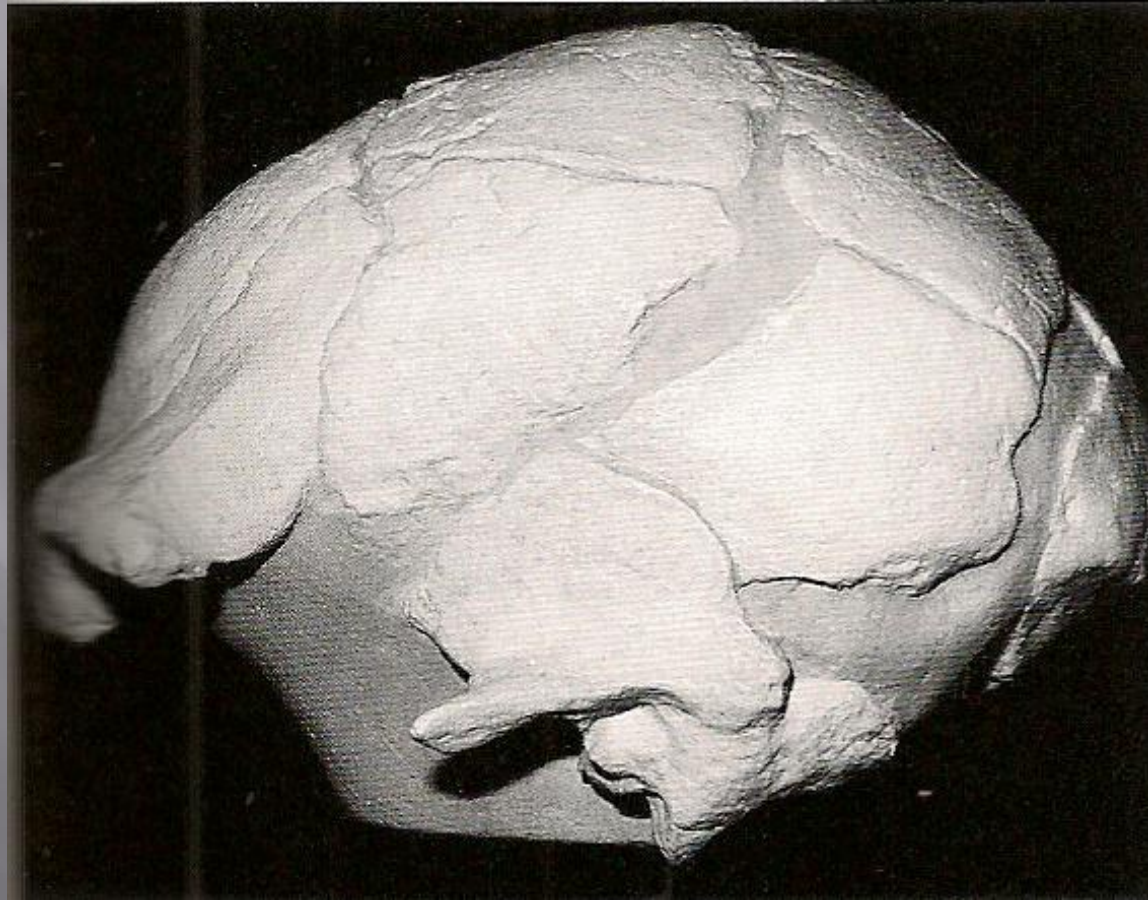


# Franz Weidenreich (1873–1948): Oldest Neandertal & *Homo erectus* in China

- ❑ German anatomist and anthropologist
- ❑ 1925: at Ehringsdorf, Germany, discovered the remains of both an adult and adolescent Neanderthal in the Fischer and Kämpfe quarries: was the oldest occurrence of Neandertals associated with Mousterian culture (150–120K)
- ❑ Wrote the monograph on *Sinanthropus* fossils at Zhoukoudian, China
- ❑ 1940: Established the name *Homo erectus* (which includes *Sinanthropus* & Javanese *Pithecanthropus*).
- ❑ Succeeded Davidson Black as head of Cenozoic Research Laboratory & collaborated with Teilhard de Chardin at Zhoukoudian.

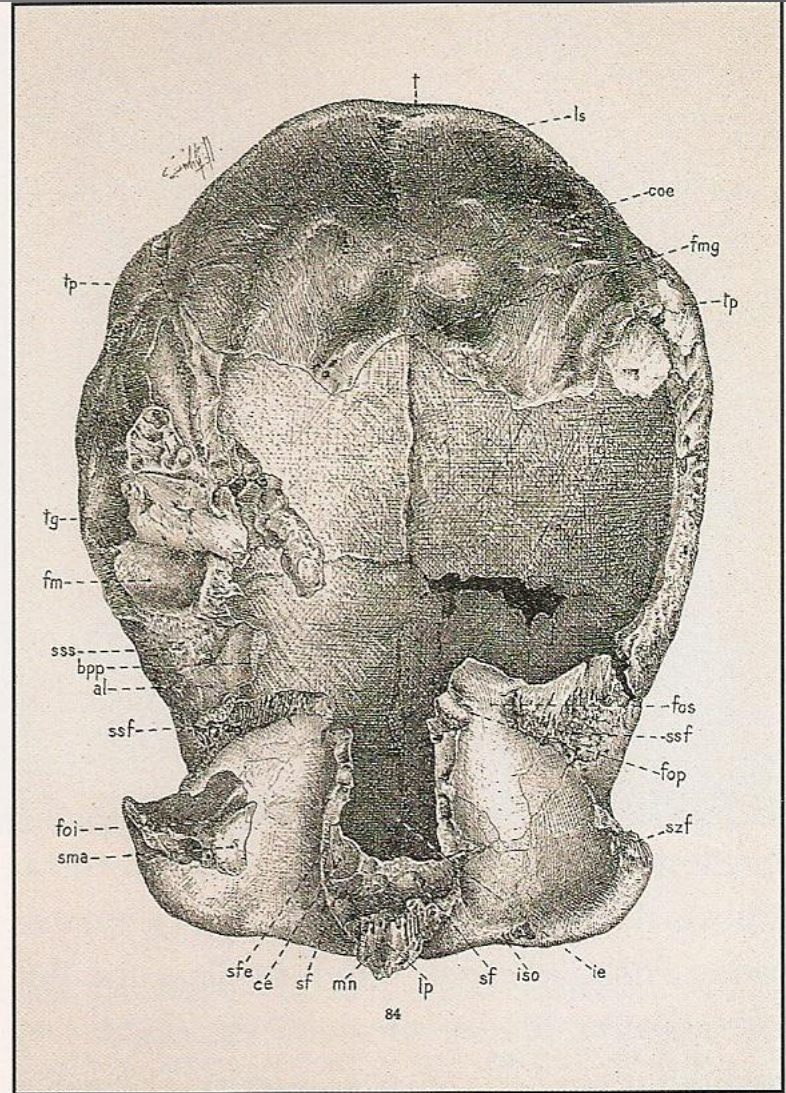
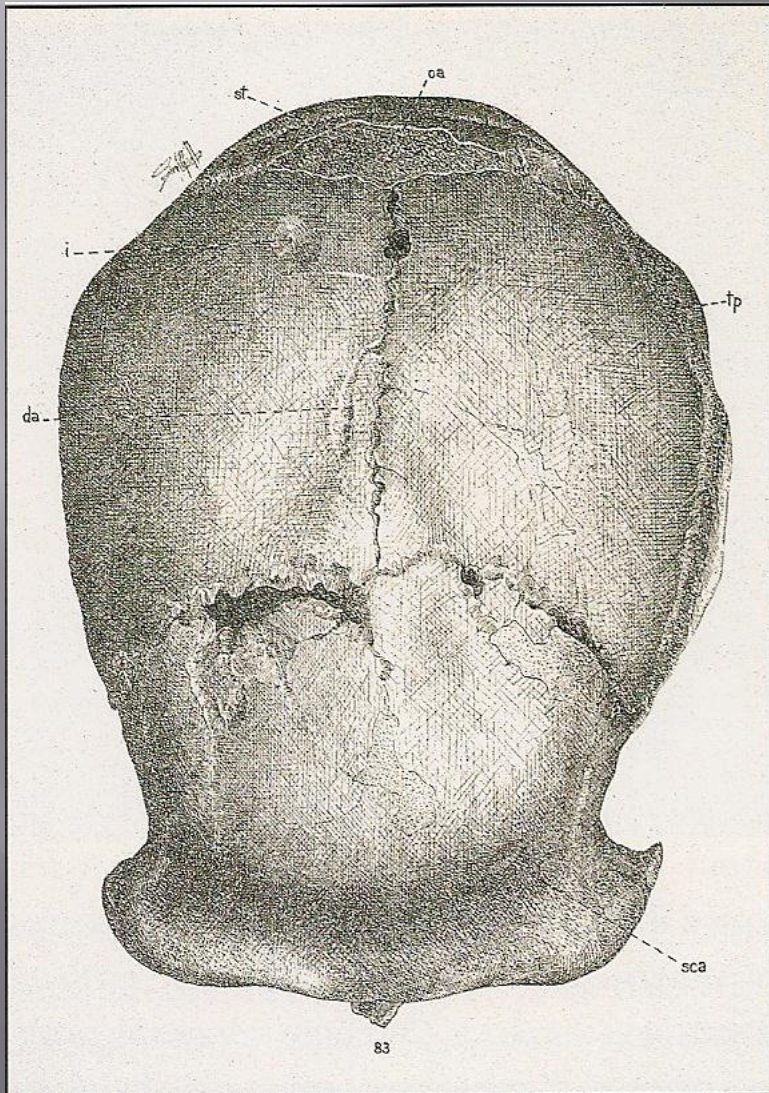


# 1925: Ehringsdorf Neandertal skull





# 1943: Franz Weidenreich's Reconstruction of *Homo Erectus*





# Ridiculed Paleontologists: “any place where the dead are disturbed”



Franz Weidenreich, who in the 1930s studied the fossils of *Homo erectus* unearthed in China, is caricatured along with Ralph von Koenigswald (wielding the shovel), who found fossils of *H. erectus* in Java. The fanciful setting is, according to the artist, "any place where the dead are disturbed."

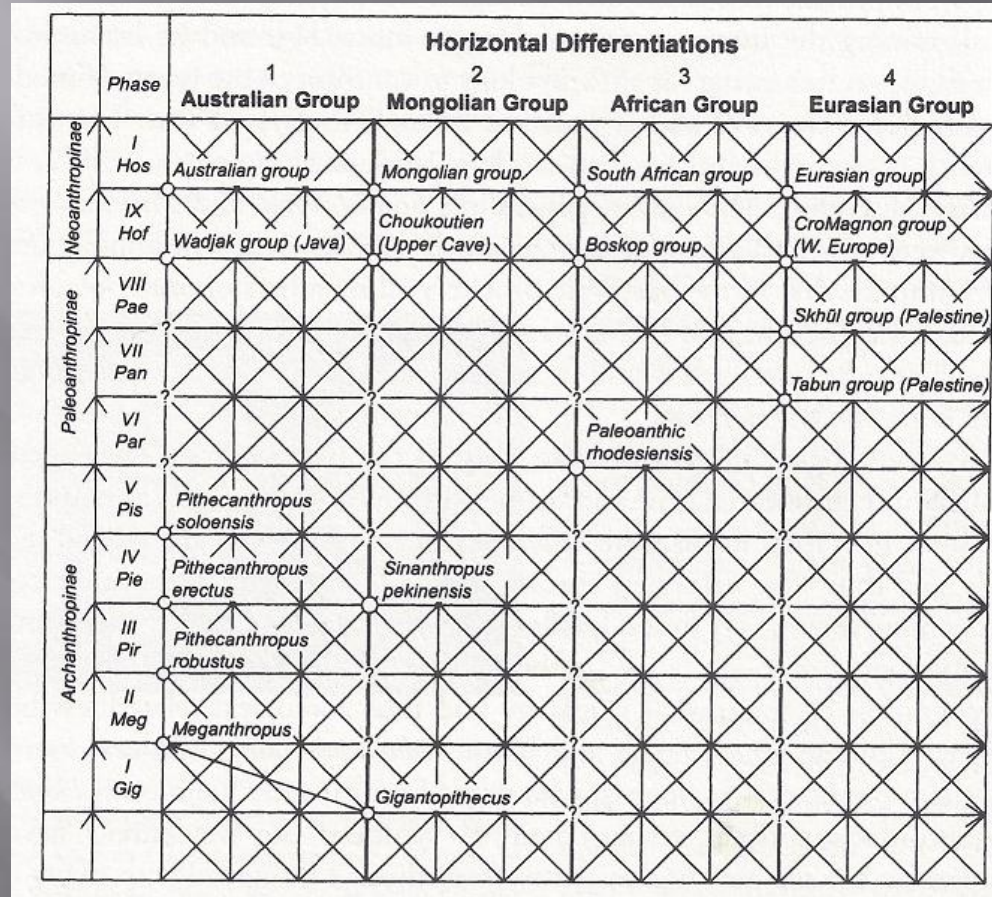
# Franz Weidenreich 2:

## Rescue of *H. erectus* casts & Regional Continuity theory

- ▣ 1941: When he moved to AMNH, he took casts, notes & photos of all Zhoukoudian fossil discoveries. All original fossils disappeared in China in 1941.
- ▣ 1947: Created the regional continuity hypothesis (multiregionalism): Weidenreich Theory states that human races have evolved independently in the Old World from Homo erectus to Homo sapiens, while at the same time there was gene flow between the various populations
- ▣ Human “races” evolved from deep roots (Australian Aborigines from Java Man; Chinese from Peking man)



# First Multiregional Theory



- Weidenreich's 1945 theory: Population networks connected by gene exchange; early idea of population genetics in human evolution



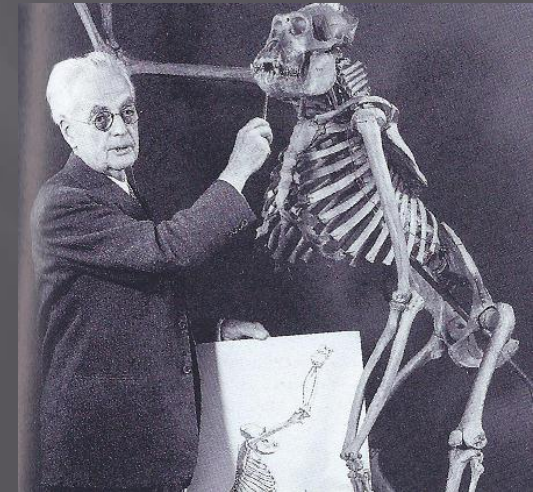
# Henry Fairfield Osborn (1857–1934): Central Asiatic Expedition, Darwin critic

- ▣ Paleontologist at AMNH
- ▣ Believed Asia was birthplace of mankind
- ▣ Sponsored Central Asiatic Expedition to the Gobi Desert
- ▣ Critic of Darwin; developed own evolutionary theory based on Piltdown man
- ▣ Believed that the ultimate outcome of evolution was the production of mankind.



# William King Gregory (1876–1970): Dentition & Palimpsest theory

- ▣ American primatologist, paleontologist
- ▣ American Museum of Natural History; a leading expert on the evolution of human dentition
- ▣ Theory that humans had closest relation to apes
- ▣ Supported R. Dart about Taung child
- ▣ Questioned Piltdown Man.
- ▣ Palimpsest theory (primitive evolutionary vs newer derived adaptive features of animals) (now mosaic evolution)



# Roy Chapman Andrews (1884 -1960): Indiana Jones – Central Asiatic Expedition to Gobi

- ▣ American explorer, adventurer and naturalist
- ▣ Believed birthplace of modern humans would be found in Asia
- ▣ Leader of the Central Asiatic Expedition to Gobi Desert (1922-1925) to find early humans (found dinosaur eggs)
- ▣ Director of AMNH
- ▣ Reputed basis of Indiana Jones



ON THE TRAIL  
OF  
ANCIENT MAN  
ROY CHAPMAN ANDREWS



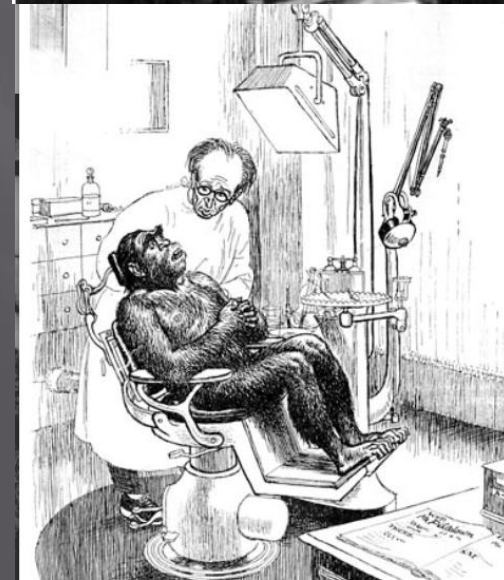
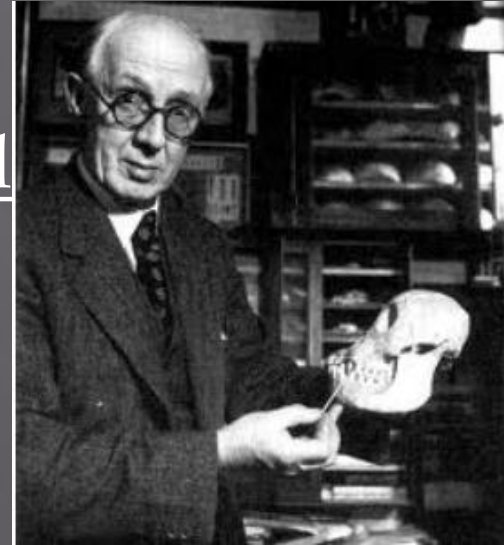
# Central Asiatic Expedition to Gobi Desert (1922-1925)



# Alvin T. Marston (1889–1971): *Homo heidelbergensis* at Swanscombe

- ▣ English dentist
- ▣ 1935: Found the Swanscombe occipital and left parietal skullbones and Acheulian tools in the Barnfield Pit, Kent; later dated at 300K; (right parietal of the skull found in 1955)
- ▣ Seriously questioned association of Piltdown fossils; believed Piltdown jaw and canine belonged to a fossil ape, but not a forgery

This may hurt, but I am afraid I'll have to remove the whole jaw! (Punch)



1935: *Homo heidelbergensis*,  
Swanscombe



Oldest human remains in Europe directly associated  
with Acheulian tools (300K)



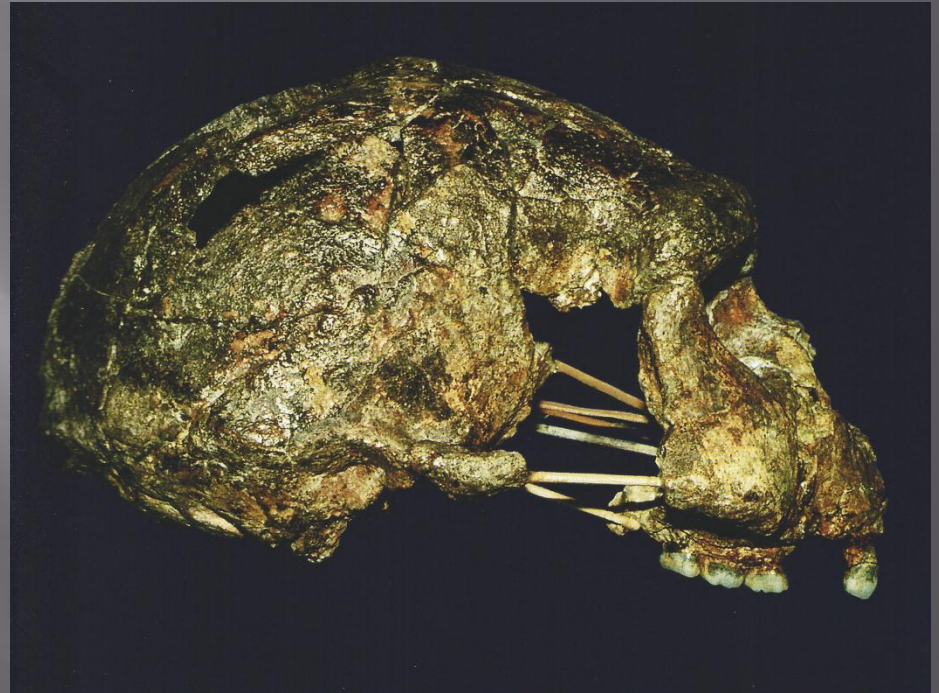
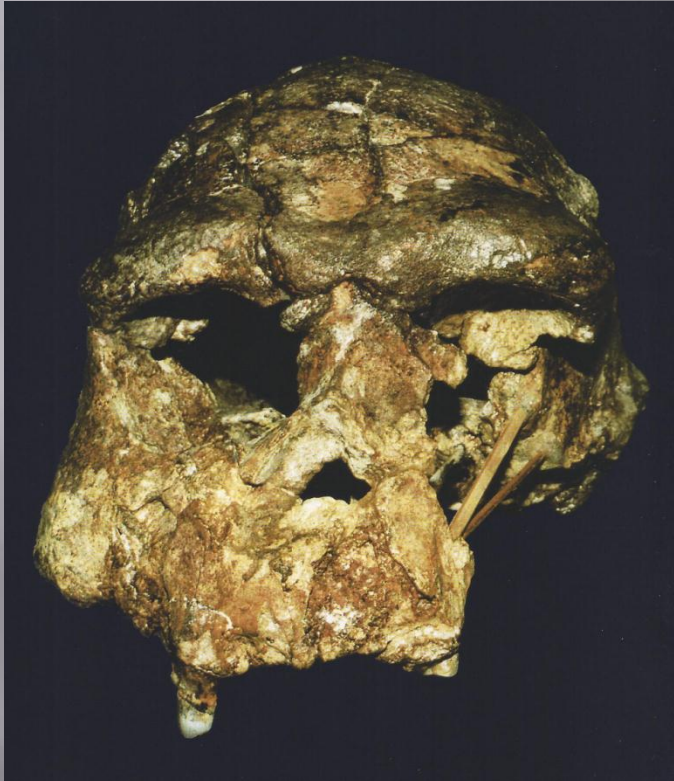
# Gustav Heinrich Ralph von Koenigswald (1902–1982):

## *Homo erectus* at Ngandong & Sangiran

- ▣ German paleontologist
- ▣ Systematic search for fossils in Java & research on *Pithecanthropus/H. erectus* at Ngandong & Sangiran in 1930s
- ▣ Discovered the *Homo erectus* fossils at Sangiran
- ▣ Sangiran: first find in one site of successive deposits with several evolutionary phases of *Homo erectus*
- ▣ Claimed that India as the original home of the Hominidae.



# 1937: *Homo erectus*, Sangiran 17



*Homo erectus*

(Sangiran 17)

Discoverer: Mr. Towikromo

Date: 1969

Locality: Sangiran, Java, Indonesia

Age 800 K

Indonesian characteristics of flat forehead & cheeks; projecting face, & flat braincase on sides and broad at base

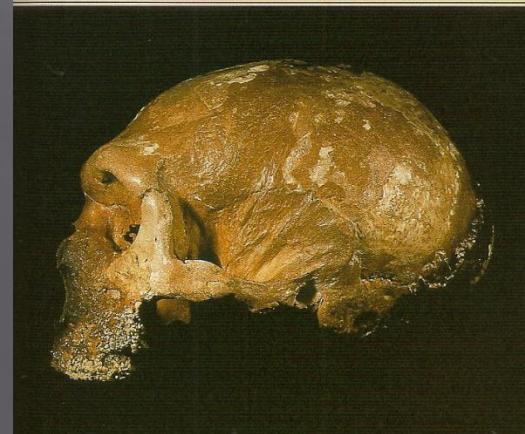
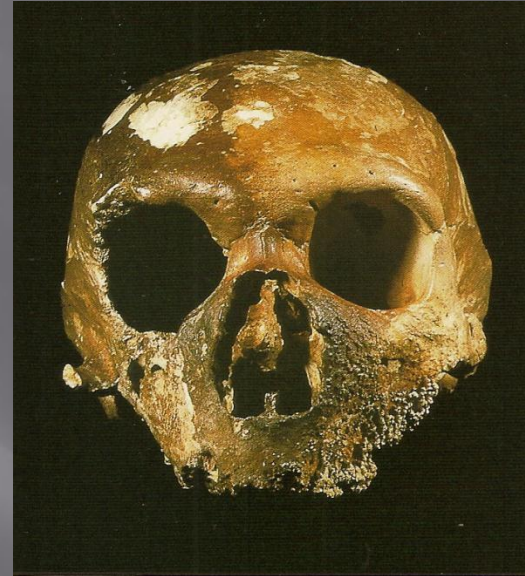
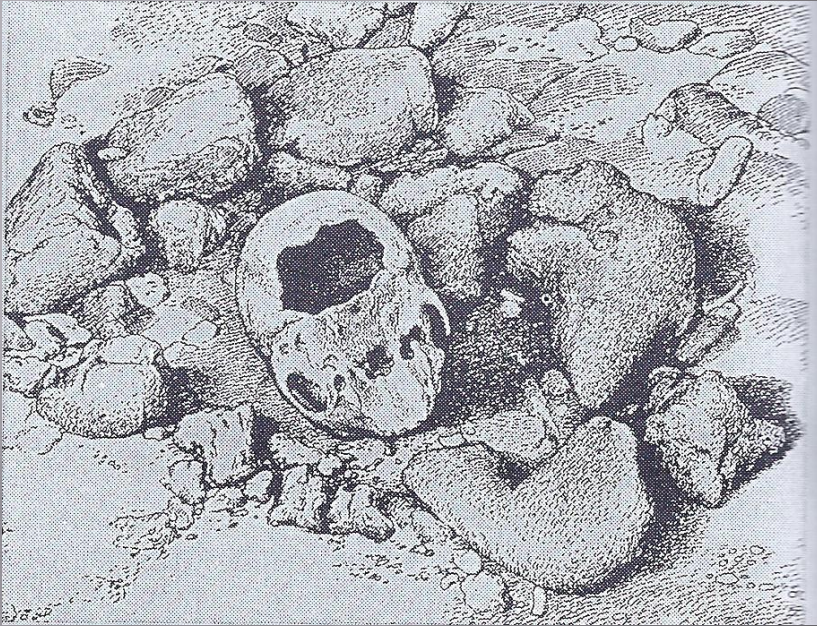
# Alberto Carlo Blanc (1906–1960): Italian Neandertal; Religious?

- ❑ Italian paleoanthropologist
- ❑ 1935: He and H. Brenne discover a second set of remains with both archaic and semi-modern features at Saccopastore.
- ❑ 1939: Discovers the Neandertal cranium from Grotta Guattari at Monte Circeo
- ❑ Found within a stone circle (Mousterian ritual?); this helped foster a growing belief in Neanderthal ritual behavior, including ceremonial cannibalism.
- ❑ Believed Neandertals had religious beliefs





# 1939: Neandertal cranium from Grotta Guattari at Monte Circeo





*1993: Homo neanderthalensis,  
Altamura, Italy*



# Camille Arambourg (1885–1969): *Homo erectus* in Africa with Acheulian tools

- ▣ French paleontologist
- ▣ Professor of paleontology at Museum national d'Histoire naturelle, Paris; Successor to Marcellin Boule
- ▣ 1955: re-analyzed the La Chapelle skeleton. and dismantled Boule's apish reconstruction of Neandertal)
- ▣ 1954: Homo erectus (*Atlantropus mauritanicus* = *H. erectus*) discovery in Ternifine, Algeria; first clear demonstration of Homo erectus in Africa with Acheulian tool associations
- ▣ 1967: French contingent of OMO Research Expedition





# 1954: *Atlantropus mauritanicus* (= *H. erectus*), Ternifine, Algeria

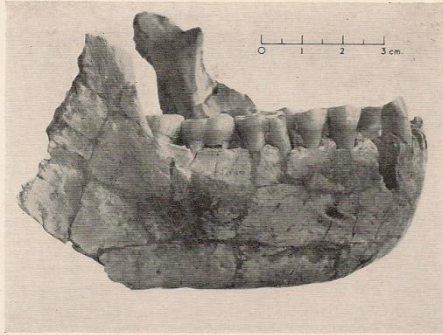


Fig. 32 The Ternifine I mandible  
Right lateral view  
Courtesy of Professor C. Arambourg

Fig. 33 The Ternifine I mandible  
Occlusal view  
Courtesy of Professor C. Arambourg

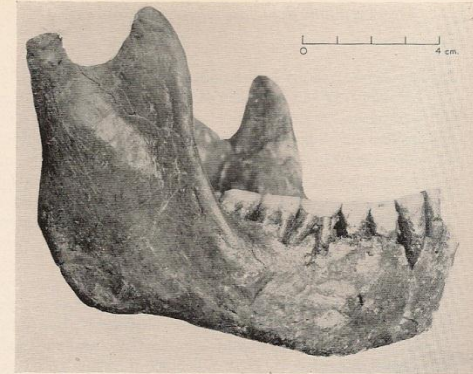
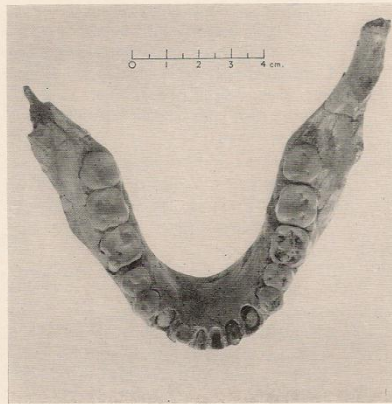


Fig. 34 The Ternifine III mandible  
Right lateral view  
Courtesy of Professor C. Arambourg

Fig. 35 The Ternifine III mandible  
Occlusal view  
Courtesy of Professor C. Arambourg



# Ernest A. Hooton (1887–1954): Neandertal differences & racial classification

- ▣ First American professor of physical anthropologist
- ▣ Professor, Harvard University
- ▣ Influential teacher of a generation of physical anthropologists
- ▣ 1946: described differences between “classic Neanderthals” from Western Europe and those with more modern appearance from central Europe or the Near East.
- ▣ Known for his work on racial classification
- ▣ Mildly racist; but maintained no correlation between race & IQ

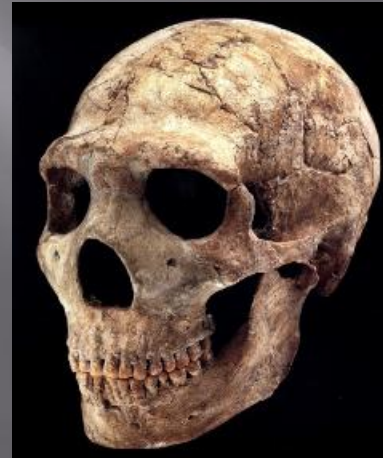


# Classic vs. Levantine Neanderthals

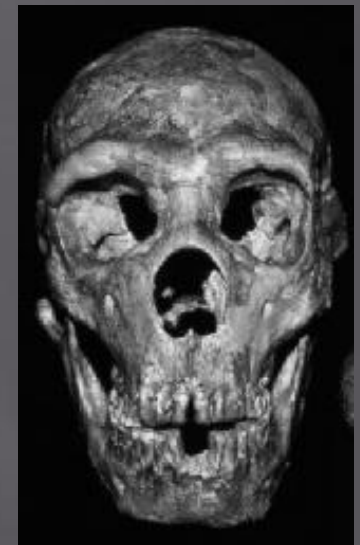
## Classic Neanderthals



**La Ferrassie, France:** considered typical of “Classic” Neanderthals – also among largest in Europe



**Amud 1:**  
Tallest (1.8 m & largest  
hominid brain

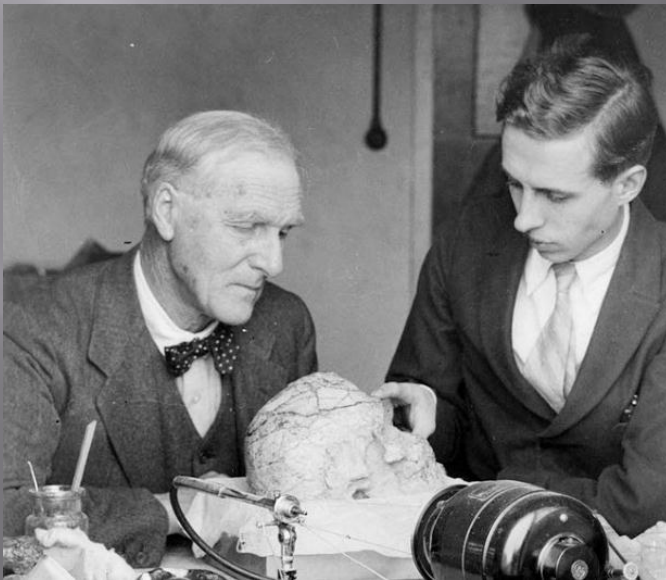


**Shanidar 1**

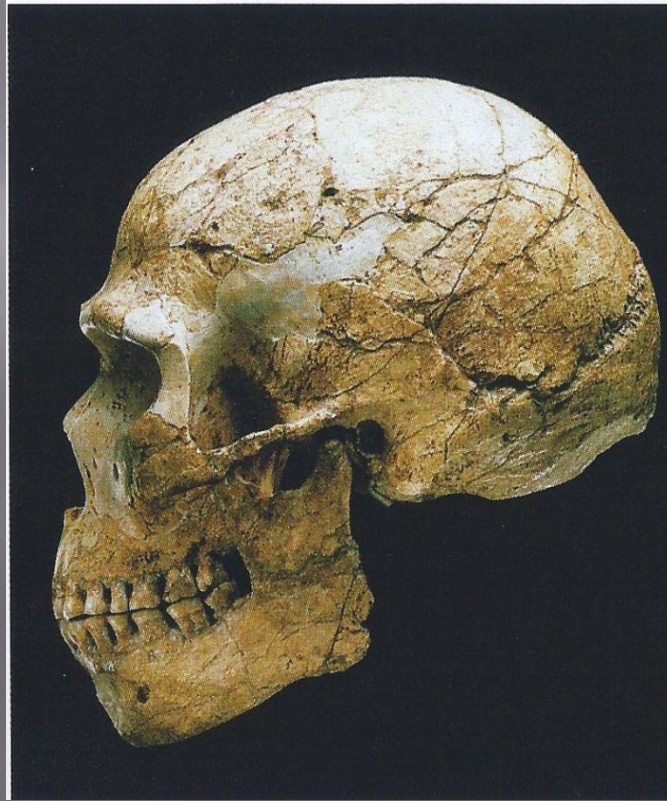
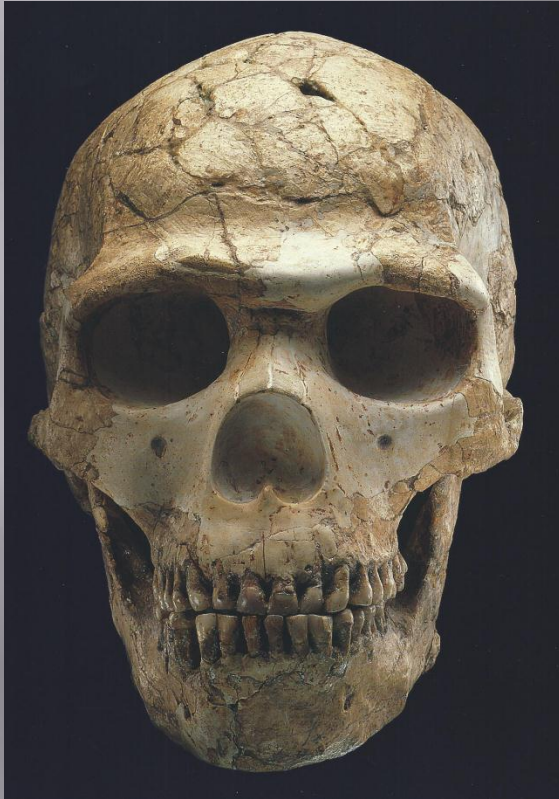


# Theodore D. McCown (1908–1969): Excavation at Skhul, transitional skulls

- ▣ American anthropologist; Univ. of Calif. Berkeley
- ▣ Supervised the digging at Skhul; large Neanderthal population sample
- ▣ Wrote up the Mount Carmel skeletons with Arthur Keith



# ~1925: *Homo Sapiens*, Skhul V



*Homo sapiens*  
(Skhul V)

Discoverers:  
Theodore McCown  
& Hallam Movius  
Jr.

Locality: Skhul cave  
Mount Carmel,  
Israel

Date: 1932

Age: 90K

Skhul/Qafzeh possess brow ridges, no chin, and a projecting facial profile, similar to the Neanderthals.

# Rene Neuville: Excavation at Jebel Qafzeh

- ▣ French archeologist and consul in Jerusalem in the 1930s
- ▣ 1934: First excavated Jebel Qafzeh, near Nazareth, and found anatomically modern human remains, 92K
- ▣ Remains of 5 individuals in the Mousterian levels
- ▣ Similar in anatomy to the individuals from Skhul (not published until 1951).



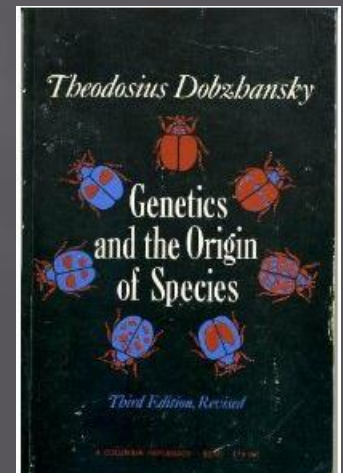
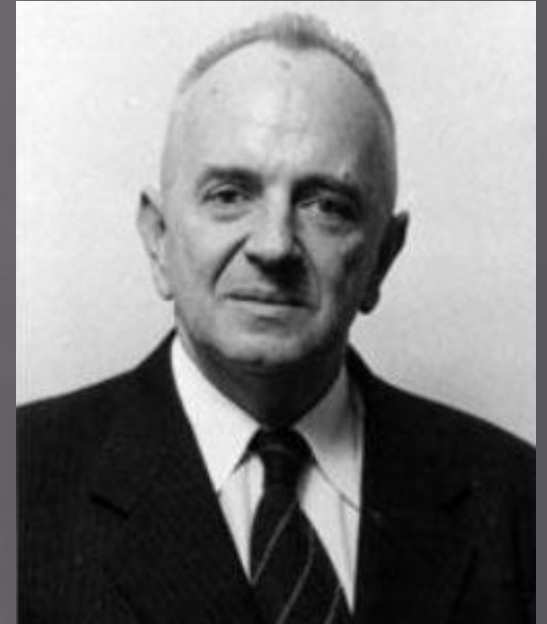


# Evolutionary Synthesis (1930–1950)

- ▣ Computational geneticists: J.B.S. Haldane, R. A. Fisher, Sewall Wright
- ▣ 3 seminal books: geneticist Theodosius Dobzhansky (gene), ornithologist Ernst Mayr (species), and paleontologist George Gaylord Simpson (origin of higher taxa)
- ▣ Central thesis: generation by generation modification of gene frequencies by natural selection; emphasis on reproductive isolation and gradualist continuities
- ▣ Effect on paleontology: Single linear model = One Hominid Species (later the multiregional/continuity model)
- ▣ Limit the number of species; emphasis on lumping, not splitting; focus on ancestors & descendants, not diversity
- ▣ Julian Huxley: author of *Evolution: The Modern Synthesis*

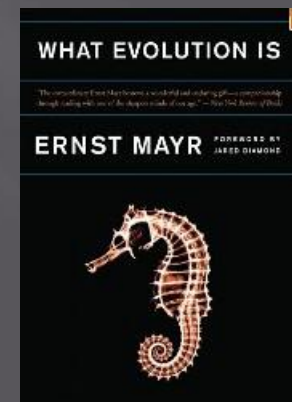
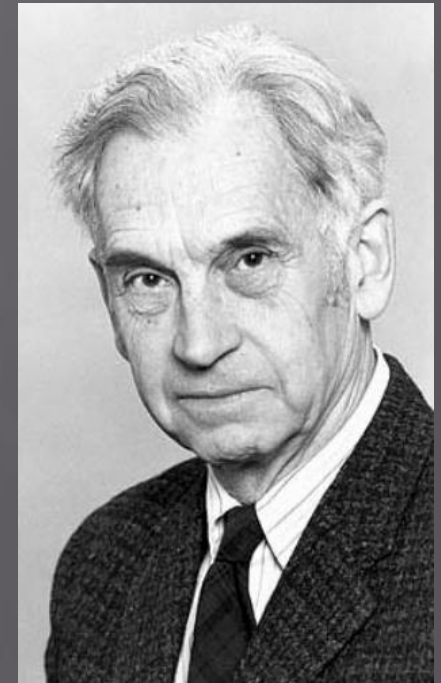
# Theodosius Dobzhansky (1900–1975): Evolutionary synthesis: One hominid species

- ▣ Fruit fly geneticist
- ▣ Architect of new evolutionary synthesis
- ▣ There has only been only one hominid species at any one time; rejected phylogenetic tree/bush model
- ▣ Never handled a fossil bone; Weidenreich was his neighbor
- ▣ Essay "Nothing in Biology Makes Sense Except in the Light of Evolution".



# Ernst Mayr (1904–2005): Biological speciation & hominid single species

- ▣ Bird taxonomist and highly influential evolutionary theorist; Harvard University
- ▣ 1942: *Systematics and the Origin of Species*: Brought together natural history & genetic theory to form the new evolutionary synthesis
- ▣ Concept of biological speciation: ability to breed together & isolation
- ▣ Problem: 29 generic names and over 100 specific names proposed for ancient human species
- ▣ Single species theory: Hominid lineage of australopithecines to *Homo erectus* to *Homo sapiens*; hominids did not speciate because they occupied all the ecological niches
- ▣ Influenced multiregional model (Brace, Wolpoff)
- ▣ Clearly a lumpener





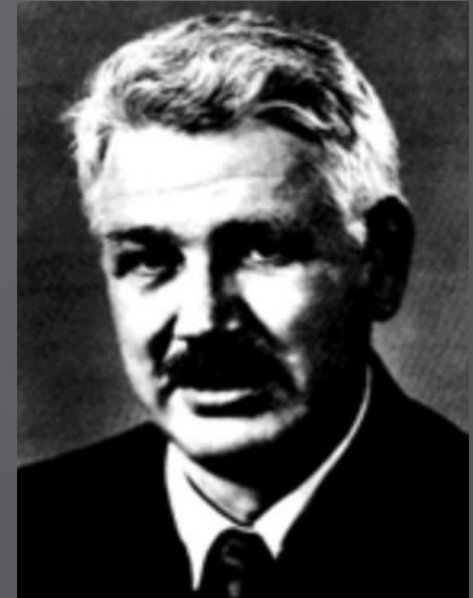
# George Gaylord Simpson (1902–1984): Genetics in evolutionary synthesis

- ▣ American vertebrate paleontologist
- ▣ American Museum of Natural History, New York
- ▣ Genetic foundation of evolutionary synthesis
- ▣ How fossil record could be interpreted in terms of natural selection and evolutionary trends: origin of higher taxa

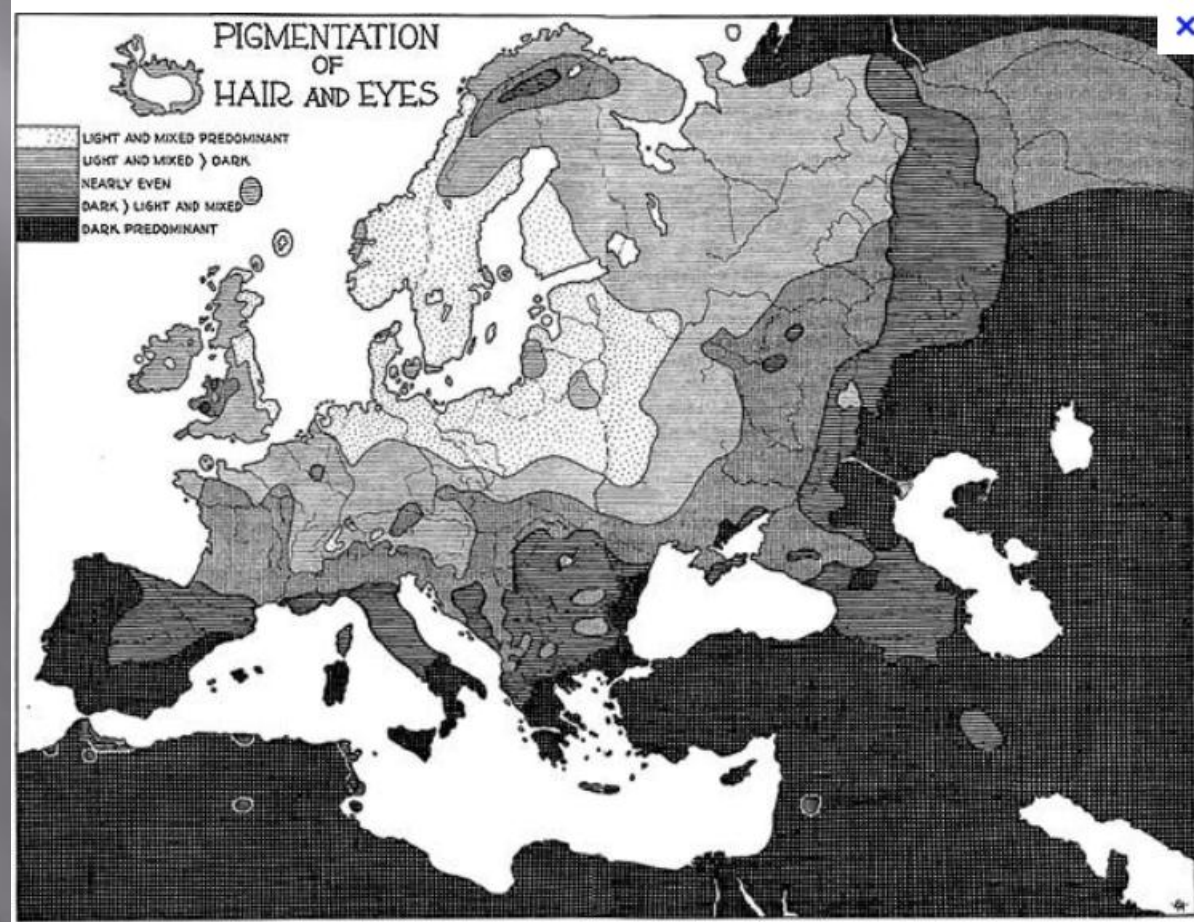


# Carlton Stevens Coon (1904–1981): Racial differences & Continuity theory

- ❑ American physical anthropologist
- ❑ Expert on racial differences: and *The Races of Europe* (1939), *The Origin of Races* (1962), *The Story of Man* (1954),
- ❑ Human races had been separate since Homo erectus & had evolved toward Homo sapiens in parallel: he reintroduces the multi-continuity hypothesis but without genetic exchange between geographically separated populations.
- ❑ Castigated as a racist in 1960s for his modified version of Franz Weidenreich's multi-regional theory
- ❑ Theory of 5 races: some races reached the Homo sapiens stage in evolution before others, resulting in the higher degree of civilization among some races.



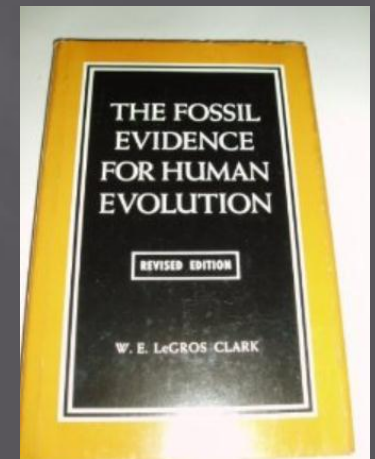
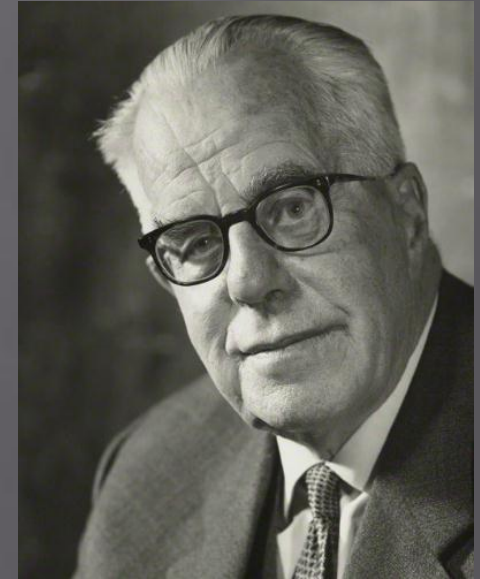
# Races of Europe, 1939





# Sir Wilfred Edward Le Gros Clark (1896–1971): Primatology, Taung Child, Piltdown discredited

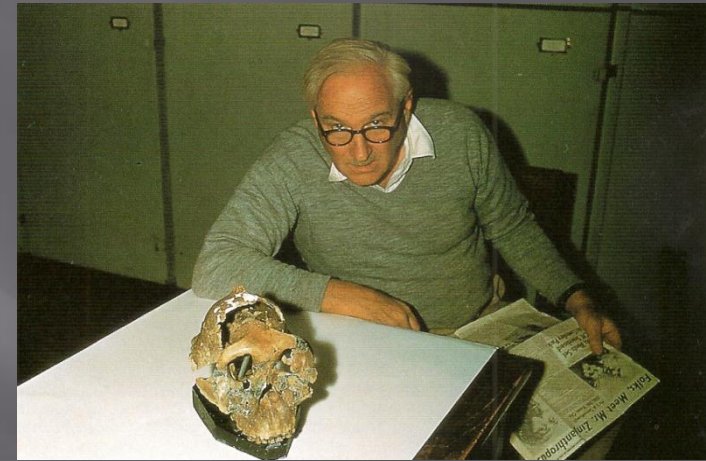
- ▣ British anatomist; professor at Oxford
- ▣ Dubbed the first primatologist
- ▣ 1947: spoke out in favor of Raymond Dart's assessment of Taung skull
- ▣ Helped K. Oakley & J. Weiner to expose Piltdown hoax in 1953
- ▣ While he never found any human fossils, he had major scholarly influence on primate evolution and human origins via his 4 books



# Louis Seymour Bazett Leakey (1903–1972): Public face of Paleoanthropology

- ❑ Pioneer East African paleontologist
- ❑ One of the most renowned paleoanthropologists of all time; always controversial
- ❑ 1943-1947: handaxes at Olorgesailie, Kenya, 400K
- ❑ 1959: son Jonathan Leakey found & Mary Leakey unearthed the first robust *Zinjanthropus boisei* (OH5) at Olduvai Gorge, Tanzania; first claimed as human ancestor; Later, reclassified as *Australopithecus*, then *Paranthropus*.
- ❑ 1960: with Mary, discovered the skull and hand of *Homo habilis*, 1.75 million years old. Published with Phillip Tobias & John Napier
- ❑ Controversial involvement with Calico Hills, CA search for early man (not hominid artifacts)

# Louis Leakey



1920, Leakey as fully initiated Kikuyu Tribe member



*Paranthropus boisei*:  
Most famous Olduvai Gorge fossil; “Zinj”



1959: Zinj, OH5



*Australopithecus/Paranthropus boisei*  
(OH 5, type)

Discoverer: Mary Leakey

Locality: Olduvai Gorge, Tanzania

Age: 1.8 M

Date 1959

# Paranthropus boisei, Sexual dimorphism



OH 5, male



KNM-ER 732, female

# *Homo habilis*



*Homo habilis*,  
(OH 7 type)

Discoverer: Jonathan Leakey

Locality: Olduvai Gorge, Tanzania

Age: 1.75 M

Date 1960



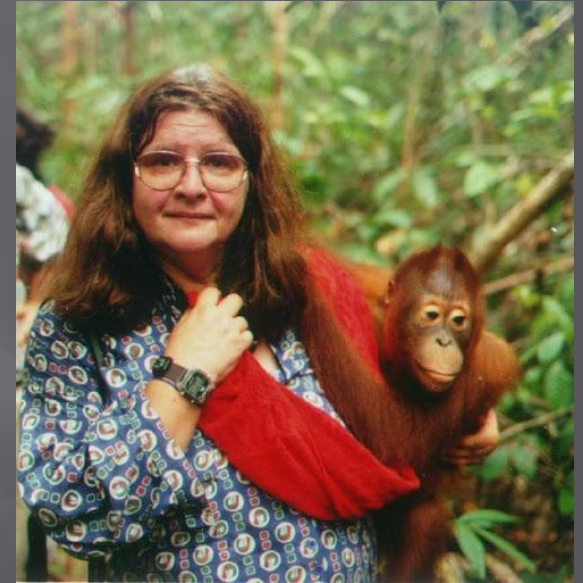
# Leakey's Angels: Go study apes!



Jane Goodall



Dian Fossey



Birute Galdikas

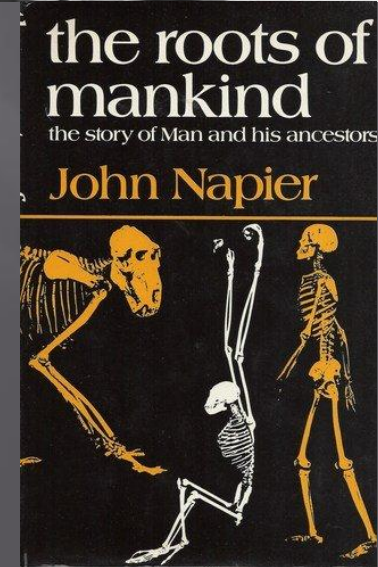
# Phillip Vallentine Tobias (1925–2012): Described & Named *Homo habilis*

- ❑ South African paleoanthropologist & Professor Emeritus at the University of the Witwatersrand in Johannesburg, succeeding Raymond Dart.
- ❑ Tobias has excavated at the Sterkfontein caves and worked at almost all other major sites in Southern Africa since 1945.
- ❑ 1964: Collaborating with Louis Leakey, Tobias identified, described and named the new species *Homo habilis*.
- ❑ At the Sterkfontein site: the largest single sample of *Australopithecus africanus* as well as the first known example of *Homo habilis* from Southern Africa
- ❑ Published over 600 journal articles and authored or co-authored 33 books
- ❑ Anti-apartheid activist



# John Russell Napier (1917–1987): *Homo habilis*

- ▣ British anatomist
- ▣ Primate evolutionary biology
- ▣ Studied *Proconsul africanus*
- ▣ With Philip Tobias & Louis Leakey, named *Homo habilis* as a species
- ▣ 3 influential books, incl. *The Roots of Mankind*, 1971



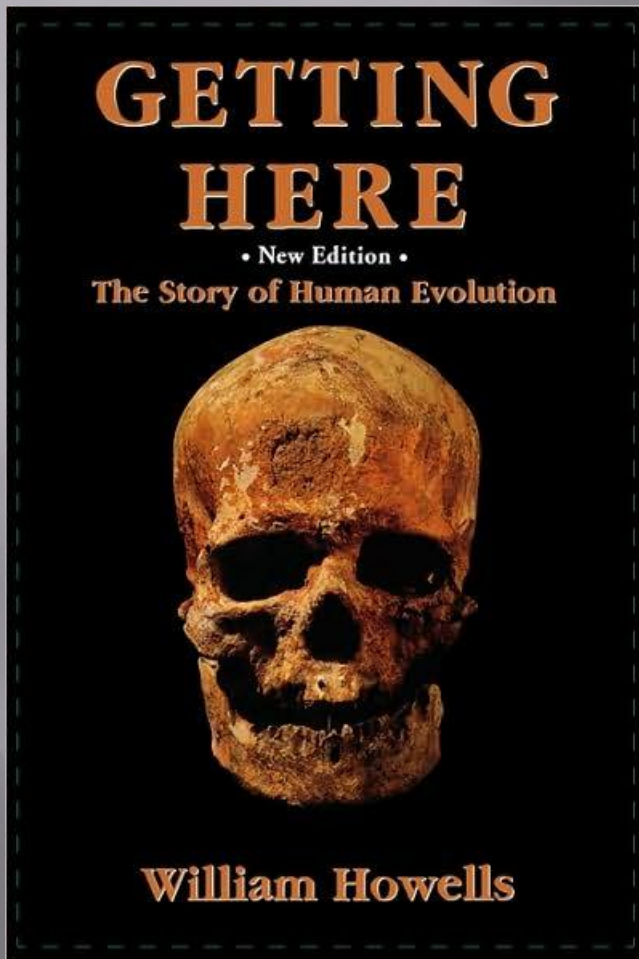


# William W. Howells (1908–2005): Statistical skull methodology & “Neandertal”

- ▣ Professor of anthropology, Harvard University
- ▣ Student of E. A. Hooton
- ▣ Worked at AMNH
- ▣ Pioneer in measurement and statistical analysis of skulls: applied multivariate statistics to paleoanthropological studies
- ▣ Modern humans are one species with little to tell them apart
  
- ▣ 1952: He and Henri Vallois suggest use of the spelling “Neandertal” as removing the “h” conforms with changes in German spelling.



# Howells's books



## *Mankind in the Making*

*The Story of Human  
Evolution*

*by William W.  
Howells*

*Doubleday*

# G. Edward Lewis (1908–):

## *Ramapithecus: hominid or Orangutan ancestor*

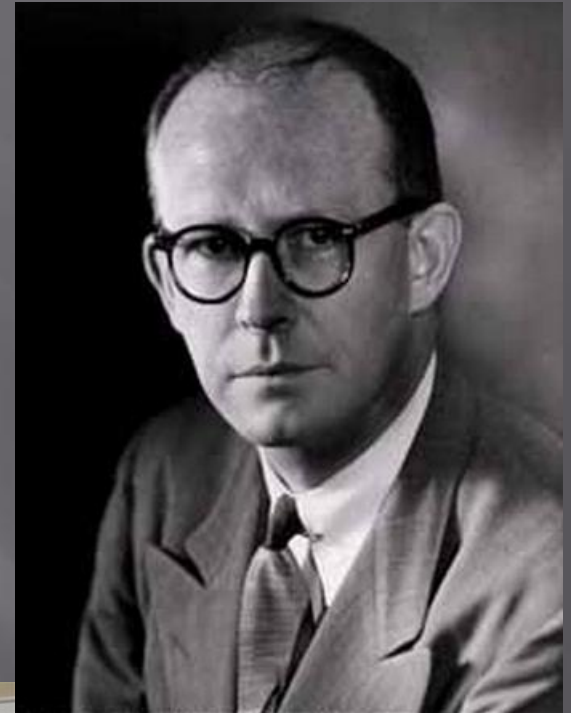
- ▣ American geologist
- ▣ 1934: Discovered a hominoid lower jaw at Haritalyanger, Siwalkik Hills, India
- ▣ Described it as type specimen of *Ramapithecus*.
- ▣ Believed that *Ramapithecus* was early hominid; supported by Elywn Simons in 1960s.
- ▣ In 1980s, evidence that *Ramapithecus* was closely related to *Sivapithecus*, a Miocene ancestor of orangutan.





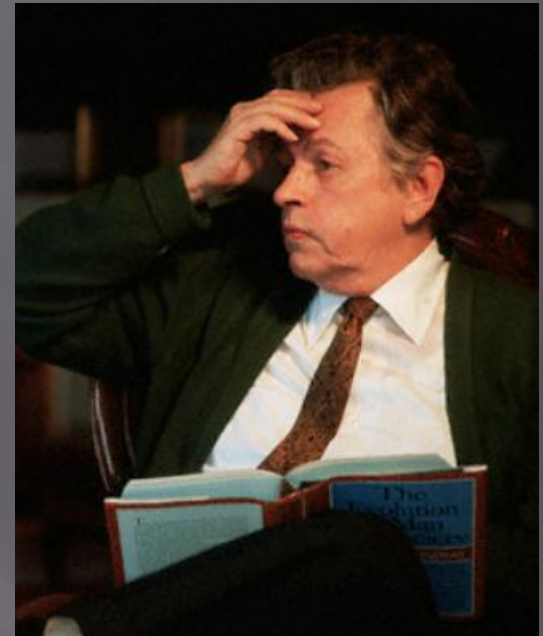
# Willard Frank Libby (1908–1980): Radiocarbon dating

- ▣ American chemist
- ▣ 1947: developed the radiocarbon dating method; received Nobel Prize in 1960
- ▣ Revolutionary impact on archeology for material less than 50K



# Robert Ardrey (1908–1980): Screenwriter & anthropology writer

- ▣ American playwright and screenwriter who returned to his academic training in anthropology
- ▣ Wrote *African Genesis* (1961), *The Territorial Imperative* (1966), *The Social Contract* (1970), and *The Hunting Hypothesis* (1976) detailing the mid-20<sup>th</sup> century transition in paleoanthropologist studies and methodology.
- ▣ Proponent of the hunting hypothesis and the killer ape theory.



# Mary Leakey (1913–1996):

## Discoverer of Proconsul, Zinj, & Laetoli footprints

- ❑ Mary Douglas Nicol; British archaeologist and anthropologist
- ❑ As famous as her husband Louis.
- ❑ 1948: discovered the first *Proconsul africanus* on Rusinga Island, Lake Victoria; 18MY
- ❑ 1959: discovered the robust *Zinjanthropus* skull at Olduvai Gorge.
- ❑ Classification system of Oldowan tools.
- ❑ 1960: became director of excavations at Olduvai.
- ❑ 1978: discovered, with Tim White, Laetoli footprints, dated 3.7 million years ago; clearly bipedal.





# Importance of Elephant Dung

- ▣ 1976, when paleoanthropologist Andrew Hill and a colleague were tossing elephant dung at each other in Laetoli, a hominid archeological site in Tanzania. As Hill dived out of the way, he stumbled on what turned out to be some fossilized animal footprints.
- ▣ In 1977, large elephant tracks were found by **Mary Leakey's son Philip** and a co-worker, **Peter Jones**, and alongside them some tracks that looked suspiciously like human footprints
- ▣ This was the origin of one of the wonders of prehistoric finds: a trail of hominid footprints about 3.6 million years old.

# Mary Leakey



1948: *Proconsul africanus*



1959: *Paranthropus Boisei*



1978: Laetoli *A. afarensis*  
footprints

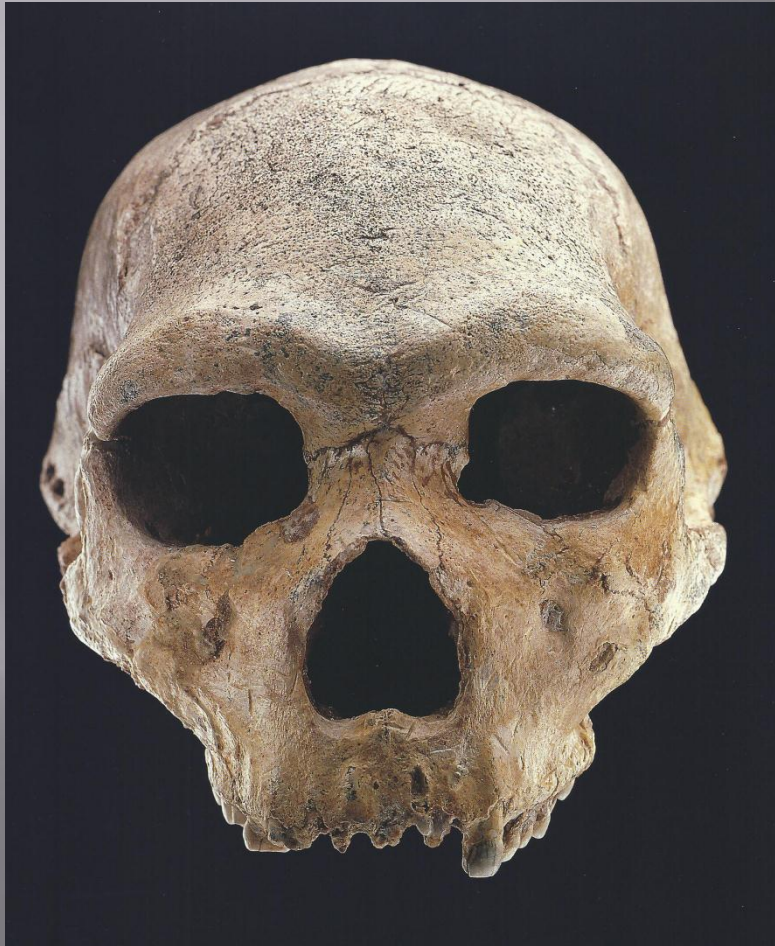
# Aris Poulianos (1924–): *Archanthropus europeaus petraloniensis*

- ▣ Greek anthropologist and archaeologist
- ▣ 1960: Poulianos studied the Petralona skull & named the hominid *Archanthropus europeaus petraloniensis*, and estimated its age to be around 700,000 years old.
- ▣ Today, dated 200-400 kyr & classified as archaic *H. sapiens*/*Homo heidelbergensis*





# 1960: *Homo heidelbergensis*: Petralona skull



*Homo heidelbergensis*  
(Petralona 1)

Discoverers: J. Malkotsis, J. Stathis, B. Avaramis, C. Sarijanides, & C. St. Hantzarides

Date: 1960

Locality: Katsika Hill, Petralona, Greece

Age 400 K

# David Pilbeam (1940–):

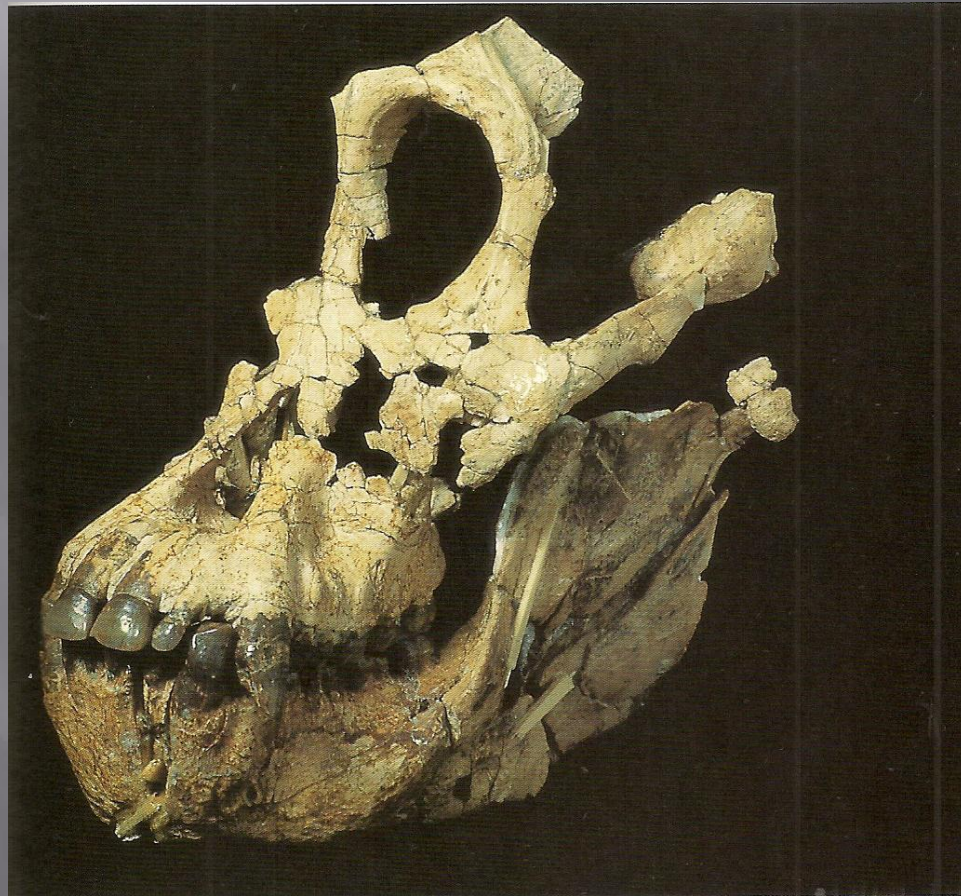
## Ramapithecus, Sivapithecus, Sahelanthropus

- ▣ English anthropologist
- ▣ Harvard University Center for the Environment, Department of Human Evolutionary Biology
- ▣ 1969: championed *Ramapithecus* as an early hominid
- ▣ 1970s: he was a co-discoverer, in the Potwar Plateau of Pakistan, of a nearly complete skull subsequently described as belonging to *Sivapithecus indicus*, an extinct Late Miocene great ape
- ▣ Worked on the description and analysis of the new hominin from Chad, *Sahelanthropus tchadensis*





*Sivapithecus indicus*:  
Orangutan ancestor





# Francois Bordes (1919–1981): World's preeminent stone classifier & knapper

- ▣ French prehistorian, geologist and archeologist
- ▣ Classification (Systeme Bordes) of Mousterian stone-tool industries: proposed standard, typological system for classification of Lower & Middle Paleolithic tools based on European sequence
- ▣ Expert in replicating flint tools

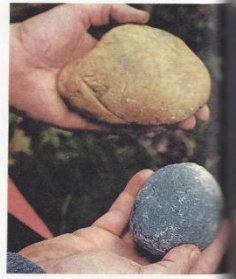


# Francois Bordes: Stone knapping

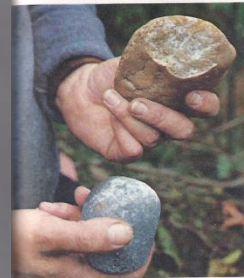
## A Master Toolmaker

François Bordes, professor of prehistory at the University of Bordeaux in France, is the outstanding authority on Paleolithic tools. At the age of 14 he became fascinated with the ancient artifacts he found near his home, and he set out to learn all he could about how they were made and used. After studying geology and prehistory in Paris, Bordes returned to southwestern France, where he now teaches. Each summer he spends six to eight weeks excavating several important early man sites in the Dordogne valley, where he continues to experiment with flint toolmaking techniques. Bordes is able to make, within a few minutes, all of the known varieties of Paleolithic implements. He practices almost constantly on a large supply of fresh flint nodules which he keeps in the backyard of his home and at a farm near his favorite site.

### MAKING A CHOPPING TOOL



Bordes begins with a rounded quartzite lump and a smaller hammerstone. With



two or three blows he can produce a rough but serviceable cutting edge. Such



tools as this were early man's basic weapon and hunting implement for over



a million years. They have been found in Africa, the Middle East and in Asia.

### MAKING AN ACHEULIAN HAND-AXE



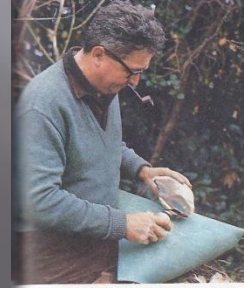
Having knocked the end off a large flint nodule, Bordes has prepared a striking



platform from which, using a hammerstone, he proceeds to strike off several



large flakes, roughing out the general shape. He then switches to an antler



hammer (fifth picture), working both sides of the tool to thin out and retouch



the edge. The final product, with its long, straight, sharp edges, is one of the



tools used for several hundred thousand years by early *Homo sapiens* hunters.

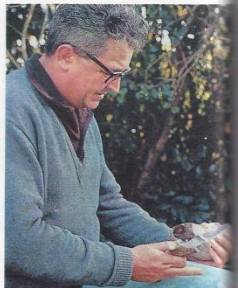
### MAKING A LAUREL LEAF POINT



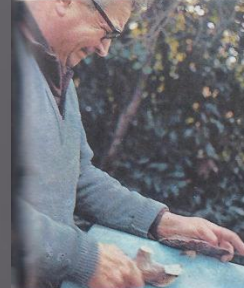
Taking a large flake, a by-product of his hand-axe, Bordes starts finishing it



with the antler hammer. Resting the flake on his knee for support, he strikes



off shallow flakes, turning the tool over and over, working both surfaces and all



the edges. Having roughed out the shape, he sharpens the tool by driving tiny



chips from the edges (fifth picture). He ends up with an exact duplicate of the



beautiful leaf points used by Stone Age hunters as spear heads and daggers.



# Edmund Crelin (1923–2004): Neandertal vocal tract

- ▣ Modern gross anatomist, Yale Medical School
- ▣ Expert in anatomy of new born
- ▣ 1971: With Phillip Lieberman, reconstructed vocal tract of Neandertals, based on La Chapelle skull, concluding Neandertal lacked true language; but reconstruction was flawed

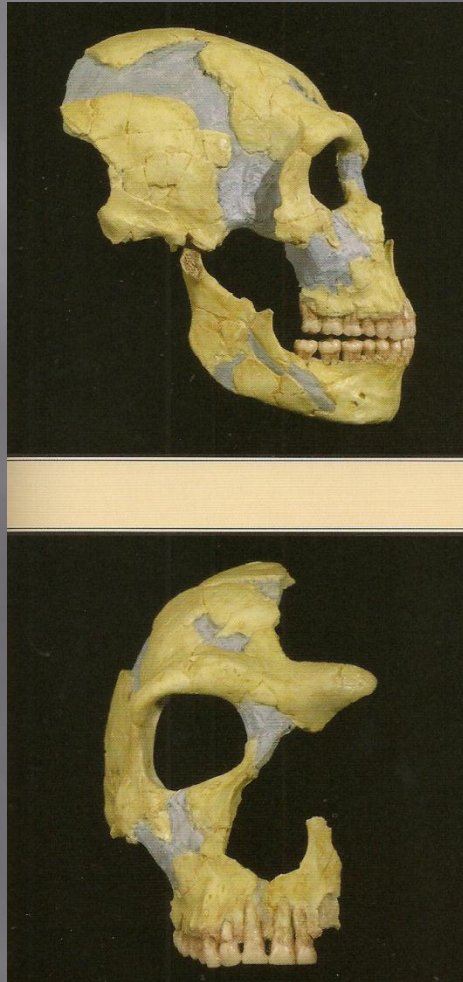




# Francois Leveque (1935–): Neanderthal & Chatelperronian tools?

- ▣ French archeologist
- ▣ 1979: Co-author, with Bernard Vandermeersch of the discovery of St. Césaire 1 Neanderthal skeleton of a young adult individual is unique in its association with Châtelperronian artifacts from a level dated to ca. 36 K; but artifact association has been questioned.
- ▣ One of the last Neandertals
- ▣ Evidence of co-existence of moderns and Neanderthal
- ▣ Lévêque and Vandermeersch, *Bulletin de la Société Préhistorique Francaise* 77, 35 (1980).

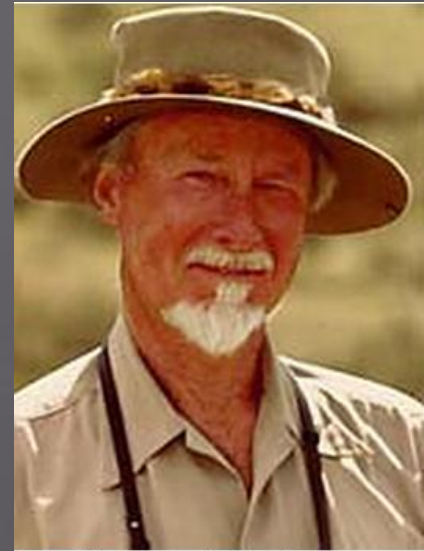
# 1979: *H. neanderthalensis*, St. Césaire



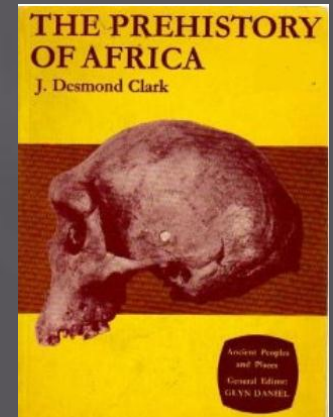
Computerized  
reconstruction

# J. Desmond Clark (1916–2002): Middle Awash Project, Ethiopia

- ▣ British archaeologist
- ▣ Professor of Anthropology at the University of California, Berkeley
- ▣ Co-leader for 20 years with T. White and Ethiopian archaeologists of the Middle Awash Project; excavated the stone tools
- ▣ Middle Awash Project discoveries:  
*Ardipithecus, Ardipithecus kadabba* and  
*Australopithecus garhi*
- ▣ 18 books, 300 articles



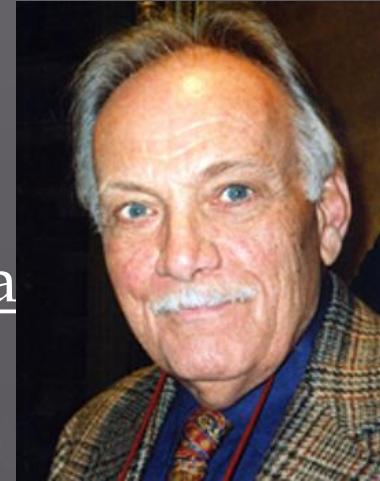
John Desmond Clark



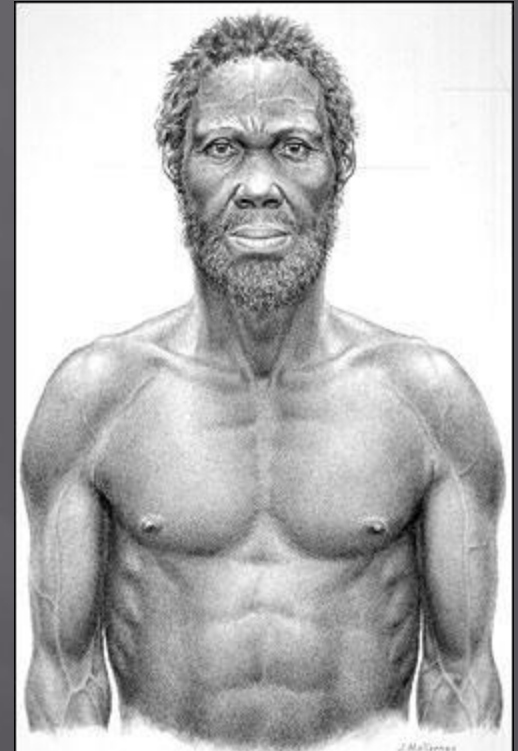


# Francis Clark Howell (1925–2007): Father of Modern Paleoanthropology

- ▣ American anthropologist
- ▣ Used new understanding of evolutionary processes to explain Neandertal morphology in terms of genetic isolation and adaptation to glacial climate
- ▣ Pioneered new dating methods based on potassium-argon radioisotope techniques and multi-disciplinary approaches
- ▣ Leader of an Omo Basin expedition
- ▣ Co-director with Tim White of the Human Evolution Research Center
- ▣ With Tim White, description of *Ardipithecus ramidus* & *Homo sapiens idaltu*
- ▣ Instrumental in the creation of the L.S.B. Leakey Foundation; Ex-president of CAS



# 2003: *Homo sapiens idaltu*, 160K



Cranium of *Homo sapiens* from Herto, Ethiopia. This specimen, BOU-VP-16/1, was recovered from the middle Awash region on the Bouri Peninsula. Dated to 155,000 years, this adult male is one of the most ancient occurrences of *Homo sapiens* thus far known. Actual size. Photograph by David L. Brill; courtesy of National Museum of Ethiopia.

Herto, Ethiopia; Bou-VP-16-1

# Jeffrey Laitman (1951-): Neandertal vocal tract

- ▣ American anatomist and physical anthropologist; Professor of the Mount Sinai School of Medicine in New York
- ▣ Has combined experimental, comparative, and paleontological studies
- ▣ Focus on the development and evolution of the human upper respiratory and vocal tract regions, incl. Neandertal's
- ▣ Argued that only *Homo sapiens* could speak



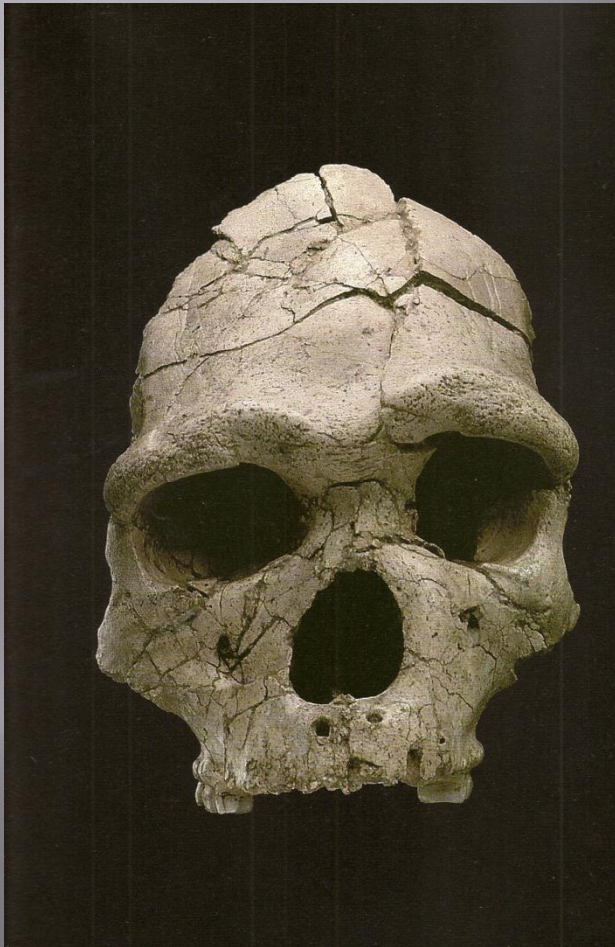


# Henry de Lumley (1934–): *Homo heidelbergensis*, Arago 21

- ▣ French archeologist, geologist and prehistorian; director of the Institute of Human Paleontology in Paris, and Professor Emeritus at the Museum of Natural History in Paris.
- ▣ 1964: Discovered the Arago 21 *Homo heidelbergensis* skull at Verdoube Valley (Arago), Tautavel, France
- ▣ Worked at variety of sites: Caune de l'Arago in Tautavel, Southern France, Terra Amata in Nice and Grotte du Lazaret near Nice, and Baume Bonne at Quinson



# 1964: *Homo heidelbergensis*, Arago 21



*Homo heidelbergensis*  
(Arago 21)

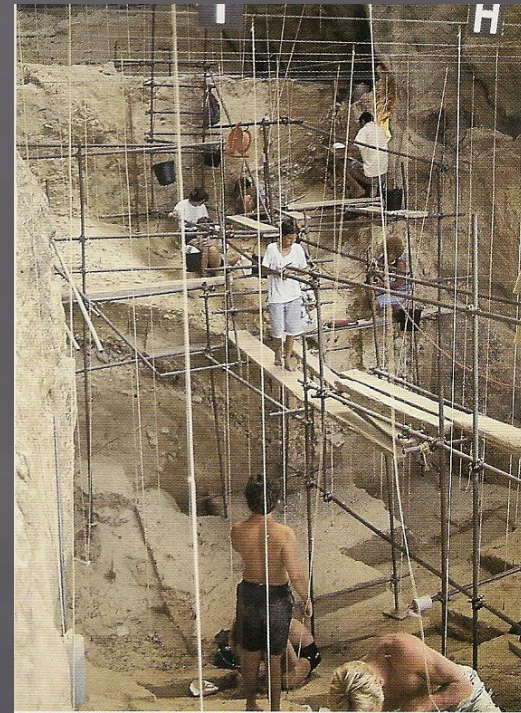
Discoverer: Henry de Lumley

Date: 1971

Locality: Caune de l' Arago

Tautavel, France

Age 400 K



Arago cave, near  
Tautavel, France

# Bryan Patterson (1909–1979): *Australopithecus anamensis*

- ▣ American paleontologist at the Field Museum of Natural History in Chicago
- ▣ 1965: *Australopithecus anamensis* discovered by his expedition at Turkana, Kenya;
- ▣ Not explicitly identified until 1994 by Maeve Leakey when work on the site finally began
  
- ▣ Bryan Patterson, Anna K. Behrensmeyer, & William D. Sill (6 June 1970). "Geology and Fauna of a New Pliocene Locality in North-western Kenya". *Nature* **226** (5249): 918–921
- ▣ Maeve G. Leakey, Craig S. Feibel, Ian McDougall and Alan Walker. 1995. "New four-million-year-old hominid species from Kanapoi and Allia Bay, Kenya". *Nature* 376:565-571.





# *Australopithecus anamensis*



# Stephen Jay Gould (1941–2002):

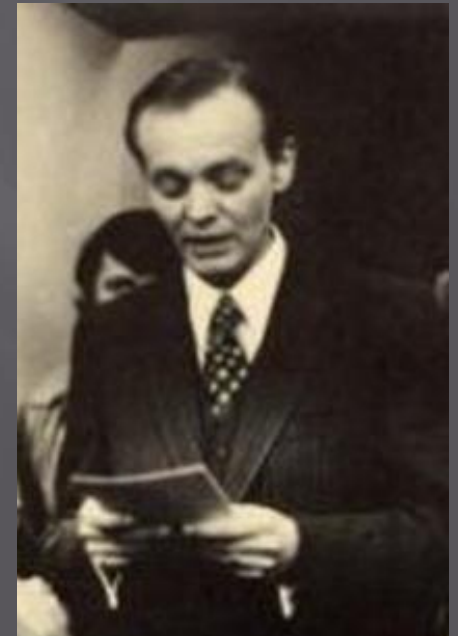
## Theory of punctuated equilibrium (evolution by jerks)

- ❑ American paleontologist, evolutionary biologist, & historian of science
- ❑ Harvard University & AMNH; snail expert
- ❑ 1972: most significant contribution to science was the theory of punctuated equilibrium, which he developed with Niles Eldredge in 1972.
- ❑ The theory proposes that most evolution is marked by long periods of evolutionary stability, which is punctuated by rare instances of branching evolution; called "evolution by jerks" vs. gradualism as "evolution by creeps"
- ❑ Theory of spandrels: Considered many higher functions of the human brain to be the unintended side consequence or by-product of natural selection, rather than direct adaptation
- ❑ Opposed sociobiology theory for humans, cladistics, evolutionary psychology



# Colin Groves (1942–) and Vratislav Mazák (1937–1987): *Homo ergaster*

- ▣ Australian archeologist
- ▣ 1975: with the Czech biologist Professor Vratislav Mazák, was the describer of *Homo ergaster*
- ▣ KNM-ER 992, a mandible discovered near Lake Rudolf (now Lake Turkana), Kenya in 1975, which became the type-specimen of the species; 1.5M
- ▣ *Homo ergaster*: first open savannah hominid (modern body form: heat shedding, strident bipedal, long slender limbs)





*Homo ergaster*,  
KNM-ER 992, type specimen  
based on small dental size

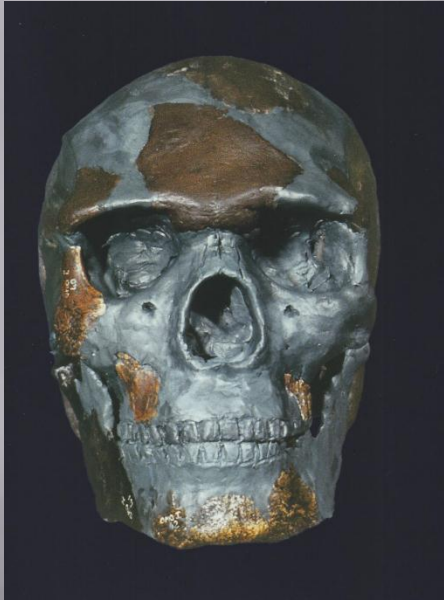


# Richard Leakey (1944–): More productive than father

- ▣ Son of Louis & Mary Leakey
- ▣ 1967: discovery of two skulls of *Homo sapiens* at Omo, Ethiopia (Omo I, Omo II); 195K
- ▣ 1969: his discovery of a cranium of *Australopithecus boisei* (KNM ER 406) at Koobi Fora, Kenya; 1.7M
- ▣ 1972 & 1975: A *Homo habilis/rudolfensis* type skull (ER 1470) and a *Homo erectus/ergaster* skull (ER 3733)
- ▣ 406 & 3733: Contemporaneous, demise of single species theory per Tattersall
- ▣ 1978: an intact cranium of *Homo erectus* (KNM-ER 3883) was discovered.
- ▣ 1984: he made his most important discovery – "Turkana Boy" – the nearly complete skeleton of a young *Homo erectus* who died 1.6 million years ago (found by Kamoya Kimeu). The most complete hominid ever found.



# *Homo Sapiens*, Omo Basin: Curved parietal, high forehead, chin



*Homo sapiens*, Omo II

*Homo sapiens*

(Omo I)

Discoverer: Kamoya Kimeu

Date: 1967

Locality: Kibish, Omo Basin, Ethiopia

Age: 195K

At 195K, one of oldest known  
modern human fossils



*Homo habilis-rudolfensis*  
KNM-ER 1470



*Homo rudolfensis*

(KNM ER 1470, type)

Discoverers: Bernard Ngeneo

Date: 1972

Locality: Koobi Fora, Kenya

Age: 1.8 M

# *Homo ergaster*, KNM-ER 3733, female



*Homo ergaster*

(KNM ER 3733)

Discoverers: Bernard Ngeneo

Date: 1975

Locality: Koobi Fora, Kenya

Age: 1.75M



# *Australopithecus boisei*



A. Boisei & prior H. ergaster in sediments of same age invalidated idea that only 1 species could survive in habitat at any 1 time



*Australopithecus boisei*

(KNM ER 406)

Discoverers: Richard Leakey & H. Mutua

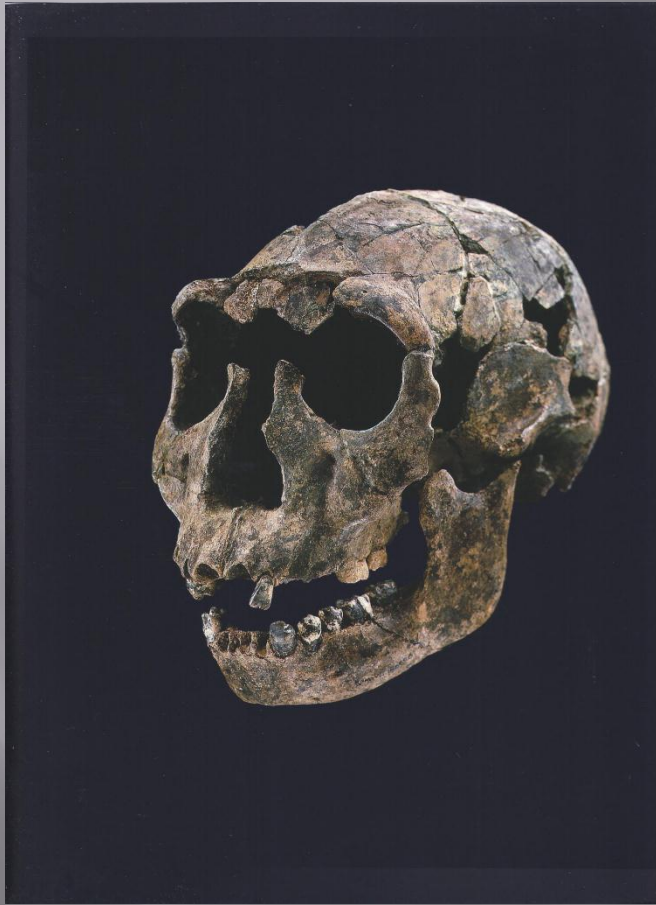
Date: 1970

Locality: Koobi Fora, Kenya

Age: 1.7 M



*Turkana Boy, Homo ergaster,*  
KNM-WT 15000, 5'5", 9 year old



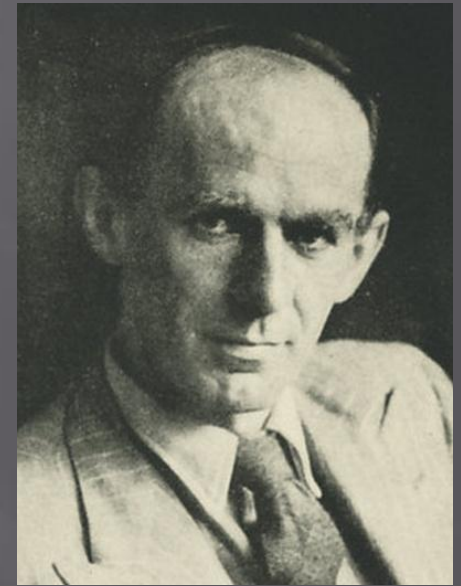
*Homo ergaster*  
(KNM WT 15000)  
Discoverers: Kamoya  
Kimeu  
Date: 1984  
Locality: Nariokotome,  
Kenya  
Age: 1.6 M



Most early hominids  
his immature male  
y surpassed a height  
courtesy of National

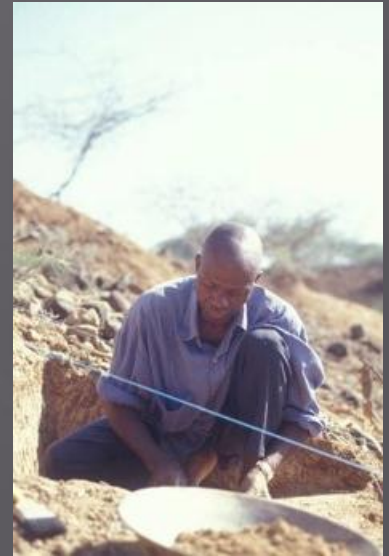
# Kenneth Page Oakley (1911–1981): Piltdown was a hoax

- ▣ British geologist & paleontologist
- ▣ British Museum (Natural History)
- ▣ Known for his work in the relative dating of fossils by fluorine content; the first method to date actual fossils, rather than the associated sediments.
- ▣ 1953: Instrumental in the exposure of the Piltdown Man hoax.



# Bernard Ngeneo

- ▣ 1972: He discovered Homo Rudolfensis (KNM ER 1470), while working at the time with a group led by Richard and Meave Leakey, at Koobi Fora, Kenya, 1.9 MY
- ▣ This is the most complete habilis skull known. (150 fragments)
- ▣ 1975: at Koobi Fora, Kenya, discovered skull of Homo ergaster , KNM ER 3733, 1.75 M





# Bernard Ngeneo



*Homo habilis-rudolfensis*  
KNM-ER 1470



*Homo erectus/ergaster*  
KNM-ER 3733

# Evo-Devo (1980-present)

- ▣ Evolutionary developmental biology
- ▣ All animals are built from essentially the same genes:  
Field of biology that compares the developmental processes of different organisms to determine the ancestral relationship between them, and to discover how developmental processes evolved
- ▣ Not until the 1980s and 1990s, however, when more comparative molecular sequence data between different kinds of organisms was amassed
- ▣ Change from genes to protein-centric perspective;  
move to gene switching perspective

# Morris Goodman (1925–2010): Molecular systematics

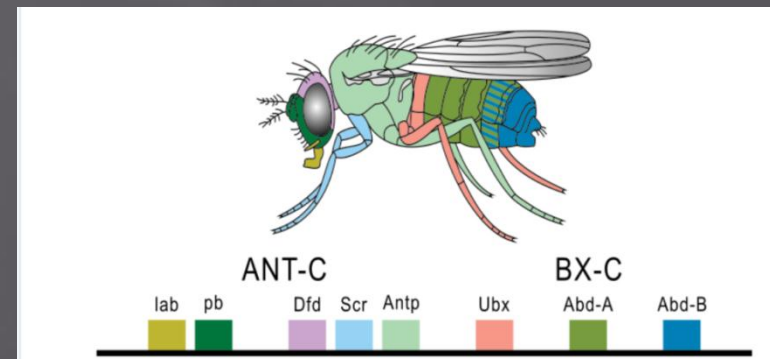
- ▣ American molecular evolutionist
- ▣ Wayne State University School of Medicine
- ▣ 1961: initiated the field of molecular systematics, evolutionary molecular phylogenetics
- ▣ Using the antibody-antigen precipitin reaction to study relationships among different species
- ▣ Apes and humans were immunological similar





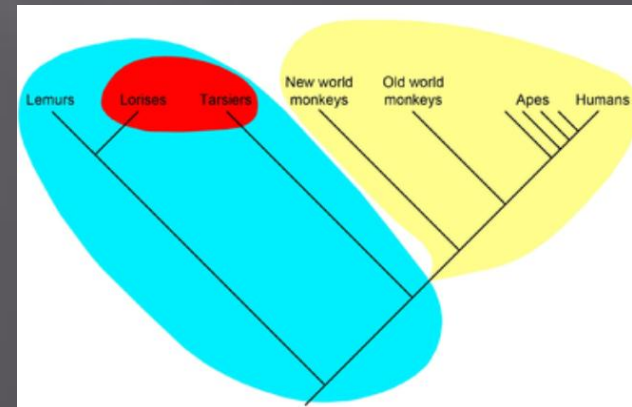
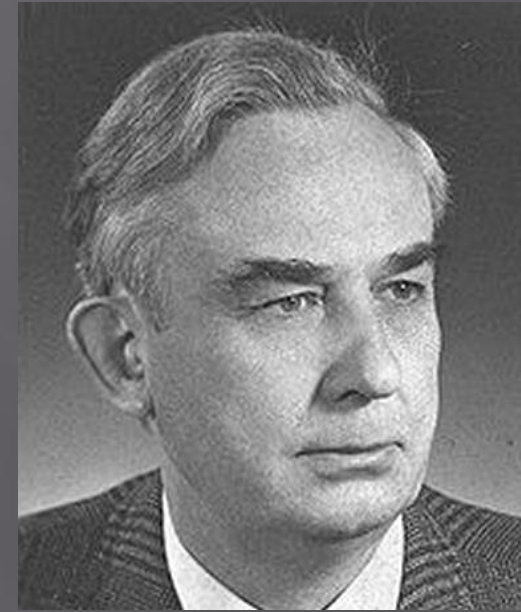
# Edward B. Lewis (1918–2004)

- ▣ Discovered homeotic genes (*Hox*), rooting the emerging discipline of evo-devo in molecular genetics.
- ▣ HOX gene: All animals have *Hox* genes, and nearly all animals use their *Hox* genes to determine which parts go where; 600M years old
- ▣ 1995 Nobel prize with Christiane Nüsslein-Volhard and Eric F. Wieschaus



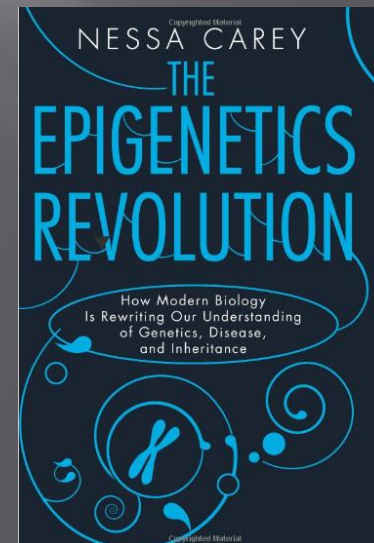
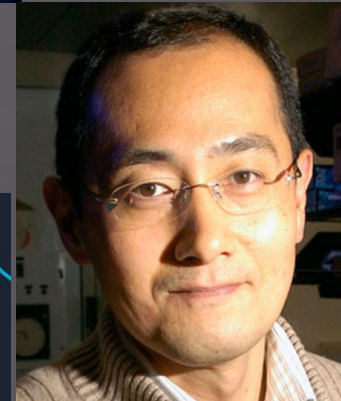
# Willi Henning (1913–1976)

- German biologist & entomologist
- 1966: Founder of phylogenetic systematics, also known as cladistics: the dominant method of classification in evolutionary biology.
- Clades, which consist of an ancestor organism and all its descendants (and nothing else).
- Cladistics focuses on shared derived characters and is specifically aimed at reconstructing evolutionary histories.
- *Phylogenetic Systematics, 1966*



# Epigenetics: Sir John Gurdon & Shinya Yamanaka

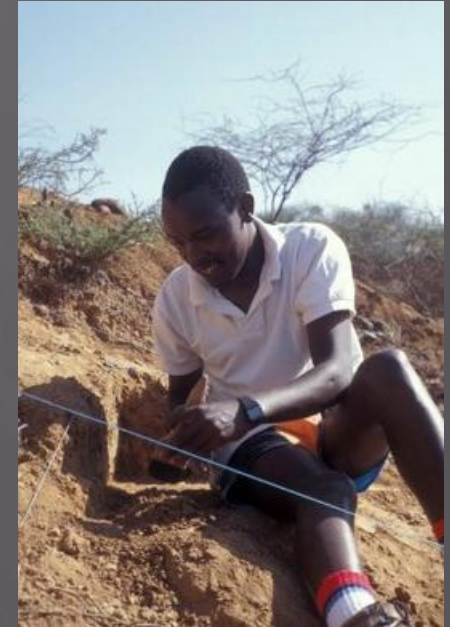
- 2012 Nobel in Medicine for discovery that mature cells can be converted to stem cells.
- Basis of Epigenetics
- 1958: John Gurdon successfully cloned a frog using nuclear transplantation
- 2007: Shinya Yamanaka generated induced pluripotent stem cells (iPS cells) from mature adult cells using 4 transcription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



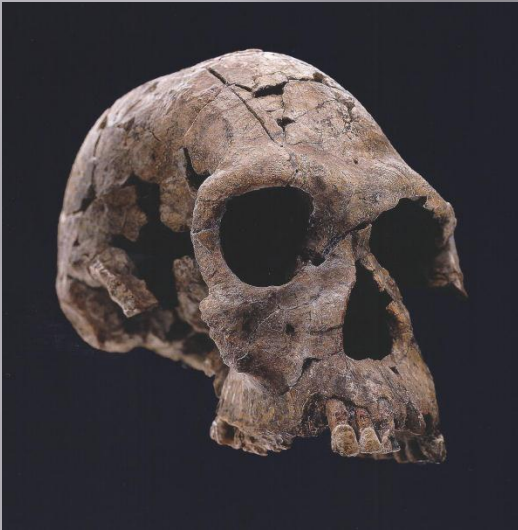


# Kamoya Kimeu (1940–)

- ❑ Kenyan fossil collector
- ❑ Began to work in paleoanthropology as a laborer for Louis Leakey and Mary Leakey in the 1950s.
- ❑ 1963: he joined with Richard Leakey's expeditions, accompanying him to the Omo River and Lake Rudolf (now Lake Turkana) in 1967.
- ❑ He quickly became Richard Leakey's right-hand man, assuming control of field operations in Leakey's absence.
- ❑ 1973: Kimeu found a *Homo habilis* skull known as KNM ER 1813
- ❑ 1975: *Homo ergaster* KNM-ER 3733, 1.75 M, at Koobi Fora
- ❑ 1977 he became the National Museums of Kenya's curator for all prehistoric sites in Kenya
- ❑ 1984: found first fragment of Turkana Boy: almost complete *Homo erectus* skeleton (KNM-WT 15000 )
- ❑ He has two fossil primates named after him: *Kamoyapithecus hamiltoni* and *Cercopithecoides kimeui*.



# Kamoya Kimeu



*Homo habilis*, (KNM ER 1813)



*Homo ergaster* (KNM-ER 3733)



Turkana Boy, *H. erectus*,  
KNM-WT 15000

# Ralph Solecki (1917–): Neandertals the Flower People

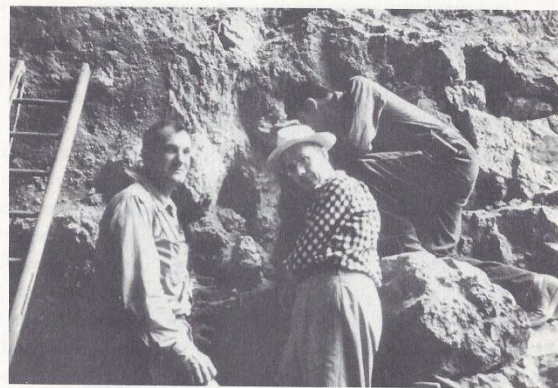
- ▣ American archeologist, Columbia Univ.
- ▣ 1957-1961: Excavated at Shanidar, Iraq
- ▣ *“Shanidar, the First Flower People”*
- ▣ First adult Neand. skeletons in Iraq, 80K.
- ▣ The excavated area produced nine skeletons (labeled Shanidar I – IX).
- ▣ Developed theory that Neandertals had religious beliefs: funeral ceremonies, burying their dead with flowers (although the flowers are now thought to be a modern contaminant; Persian Jird), and that they took care of injured individuals
- ▣ Jean Auel used his ideas for background when she was writing her Clan of the Cave Bear series.





# R. Dale Stewart (1901–1997): Shanidar Neandertals

- ▣ Physical anthropologist at Smithsonian
- ▣ Analyzed most of the Shanidar Neandertal remains (turned them over to Erik Trinkaus)
- ▣ Moderns had lived in same caves



61. Ralph S. Solecki (left) and T. Dale Stewart (middle) in 1960 during the excavations at Shanidar Cave that produced many Neandertal skeletons

# Downloads

- ▣ Charlie's website: [charlesjvellaphd.com](http://charlesjvellaphd.com)