Fossil Hominids

[Last Update: July 10, 1999]

These web pages are intended to refute creationist claims that there is no evidence for human evolution. To do this, it is first necessary to summarize the current thinking about human evolution and the fossil evidence supporting it. If you are not interested in creationism, you can read only those pages. If you are only interested in creationism, you can skip to the pages on creationist arguments; they will contain links to the fossils under discussion when necessary.

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This site will be updated on a regular basis. Contact the author (habilis@talkorigins.org) with corrections, criticisms, suggestions for further topics, or to be notified of future versions. The FAQ can be found in the talk.origins archives on the Internet at:

http://www.talkorigins.org/faqs/fossil-hominids.html (Web version)
ftp://ftp.ics.uci.edu/pub/origins/fossil-hominids (text version)

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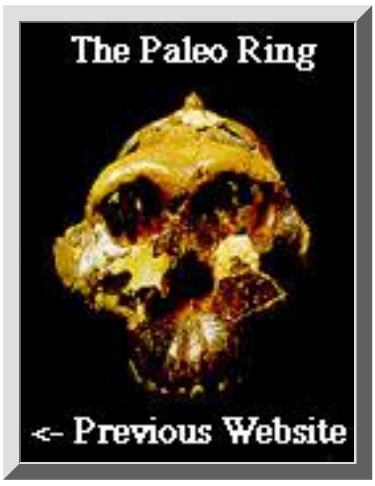

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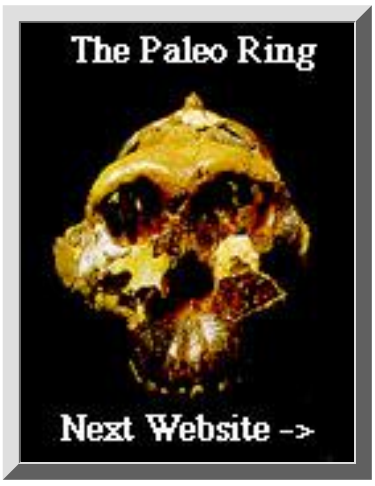

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Hominid Species

Introduction

The word "hominid" refers to members of the family of humans, Hominidae, which consists of all species on our side of the last common ancestor of humans and living apes. (Some scientists use a broader definition of Hominidae which includes the great apes.) Hominids are included in the superfamily of all apes, the Hominoidea, the members of which are called hominoids. Although the hominid fossil record is far from complete, and the evidence is often fragmentary, there is enough to give a good outline of the evolutionary history of humans.

The time of the split between humans and living apes used to be thought to have occurred 15 to 20 million years ago, or even up to 30 or 40 million years ago. Some apes occurring within that time period, such as Ramapithecus, used to be considered as hominids, and possible ancestors of humans. Later fossil finds indicated that Ramapithecus was more closely related to the orang-utan, and new biochemical evidence indicated that the last common ancestor of hominids and apes occurred between 5 and 10 million years ago, and probably in the lower end of that range (Lewin 1987). Ramapithecus therefore is no longer considered a hominid.

The field of science which studies the human fossil record is known as paleoanthropology. It is the intersection of the disciplines of paleontology (the study of ancient lifeforms) and anthropology (the study of humans).

Hominid Species

The species here are listed roughly in order of appearance in the fossil record (note that this ordering is not meant to represent an evolutionary sequence), except that the robust australopithecines are kept together. Each name consists of a genus name (e.g. *Australopithecus*, *Homo*) which is always capitalized, and a species name (e.g. *africanus*, *erectus*) which is always in lower case. Within the text, genus names are often omitted for brevity. Each species has a type specimen which was used to define it.

Ardipithecus ramidus

This species is a recent discovery, announced in September 1994 (White et al. 1994; Wood 1994). It is the oldest known hominid species, dated at 4.4 million years. Most remains are skull fragments. Indirect evidence suggests that it was possibly bipedal, and that some individuals were about 122 cm (4'0") tall. The teeth are intermediate between those of earlier apes and *A. afarensis*, but one baby tooth is very primitive, resembling a chimpanzee tooth more than any other known hominid tooth. Other fossils found with *ramidus* indicate that it may have been a forest dweller. This may cause modification of current theories about why hominids became bipedal, which often link bipedalism with a move to a savannah environment. (White et al. have since discovered a skeleton which is 45% complete, but have not yet published on it.)

Australopithecus anamensis

This species was named in August 1995 (Leakey et al. 1995). The material consists of 9 fossils, mostly found in 1994, from Kanapoi in Kenya, and 12 fossils, mostly teeth found in 1988, from Allia Bay in Kenya (Leakey et al. 1995). *Anamensis* existed between 4.2 and 3.9 million years ago, and has a mixture of primitive features in the skull, and advanced features in the body. The teeth and jaws are very similar to those of older fossil apes. A partial tibia (the larger of the two lower leg bones) is strong evidence of bipedality, and a lower humerus (the upper arm bone) is extremely humanlike. Note that although the skull and skeletal bones are thought to be from the same species, this is not confirmed.

Australopithecus afarensis

A. afarensis existed between 3.9 and 3.0 million years ago. *Afarensis* had an apelike face with a low forehead, a bony ridge over the eyes, a flat nose, and no chin. They had protruding jaws with large back teeth. Cranial capacity varied from about 375 to 550 cc. The skull is similar to that of a chimpanzee, except for the more humanlike teeth. The canine teeth are much smaller than those of modern apes, but larger and more pointed than those of humans, and shape of the jaw is between the rectangular shape of apes and the parabolic shape of humans. However their pelvis and leg bones far more closely resemble those of modern man, and leave no doubt that they were bipedal (although adapted to walking rather than running (Leakey 1994)). Their bones show that they were physically very strong. Females were substantially smaller than males, a condition known as sexual dimorphism. Height varied between about 107 cm (3'6") and 152 cm (5'0"). The finger and toe bones are curved and proportionally longer than in humans, but the hands are similar to humans in most other details (Johanson and Edey 1981). Most scientists consider this evidence that afarensis was still partially adapted to climbing in trees, others consider it evolutionary baggage.

Australopithecus africanus

A. africanus existed between 3 and 2 million years ago. It is similar to afarensis, and was also bipedal, but body size was slightly greater. Brain size may also have been slightly larger, ranging between 420 and 500 cc. This is a little larger than chimp brains (despite a similar body size), but still not advanced in the areas necessary for speech. The back teeth were a little bigger than in *afarensis*. Although the teeth and jaws of *africanus* are much larger than those of humans, they are far more similar to human teeth than to those of apes (Johanson and Edey 1981). The shape of the jaw is now fully parabolic, like that of humans, and the size of the canine teeth is further reduced compared to *afarensis*.

Australopithecus garhi

This species was named in April 1999 (Asfaw et al. 1999). It is known from a partial skull. The skull differs from previous australopithecine species in the combination of its features, notably the extremely large size of its teeth, especially the rear ones, and a primitive skull morphology. Some nearby skeletal remains may belong to the same species. They show a humanlike ratio of the humerus and femur, but an apelike ratio of the lower and upper arm.

Australopithecus afarensis and *africanus*, and the other species above, are known as gracile australopithecines, because of their relatively lighter build, especially in the skull and teeth. (Gracile means "slender", and in paleoanthropology is used as an antonym to "robust".) Despite this, they were still more robust than modern humans.

Australopithecus aethiopicus

A. aethiopicus existed between 2.6 and 2.3 million years ago. This species is known from one major specimen, the Black Skull discovered by Alan Walker, and a few other minor specimens which may belong to the same species. It may be an ancestor of *robustus* and *boisei*, but it has a baffling mixture of primitive and advanced traits. The brain size is very small, at 410 cc, and parts of the skull, particularly the hind portions, are very primitive, most resembling *afarensis*. Other characteristics, like the massiveness of the face, jaws and single tooth found, and the largest sagittal crest in any known hominid, are more reminiscent of *A. boisei* (Leakey and Lewin 1992). (A sagittal crest is a bony ridge on top of the skull to which chewing muscles attach.)

Australopithecus robustus

A. robustus had a body similar to that of *africanus*, but a larger and more robust skull and teeth. It existed between 2 and 1.5 million years ago. The massive face is flat or dished, with no forehead and large brow ridges. It has relatively small front teeth, but massive grinding teeth in a large lower jaw. Most specimens have sagittal crests. Its diet would have been mostly coarse, tough food that needed a lot of chewing. The average brain size is about 530 cc. Bones excavated with *robustus* skeletons indicate that they may have been used as digging tools.

Australopithecus boisei (was *Zinjanthropus boisei*)

A. boisei existed between 2.1 and 1.1 million years ago. It was similar to *robustus*, but the face and cheek teeth were even more massive, some molars being up to 2 cm across. The brain size is very similar to *robustus*, about 530 cc. A few experts consider *boisei* and *robustus* to be variants of the same species.

Australopithecus aethiopicus, *robustus* and *boisei* are known as robust australopithecines, because their skulls in particular are more heavily built.

Homo habilis

H. habilis, "handy man", was so called because of evidence of tools found with its remains. *Habilis* existed between 2.4 and 1.5 million years ago. It is very similar to australopithecines in many ways. The face is still primitive, but it projects less than in *A. africanus*. The back teeth are smaller, but still considerably larger than in modern humans. The average brain size, at 650 cc, is considerably larger than in australopithecines. Brain size varies between 500 and 800 cc, overlapping the australopithecines at the low end and *H. erectus* at the high end. The brain shape is also more humanlike. The bulge of Broca's area, essential for speech, is visible in one *habilis* brain cast, and indicates it was possibly capable of rudimentary speech. *Habilis* is thought to have been about 127 cm (5'0") tall, and about 45 kg (100 lb) in weight, although females may have been smaller.

Habilis has been a controversial species. Some scientists have not accepted it, believing that all *habilis* specimens should be assigned to either the australopithecines or *Homo erectus*. Many now believe that *habilis* combines specimens from at least two different *Homo* species.

Homo erectus

H. erectus existed between 1.8 million and 300,000 years ago. Like habilis, the face has protruding jaws with large molars, no chin, thick brow ridges, and a long low skull, with a brain size varying between 750 and 1225 cc. Early *erectus* specimens average about 900 cc, while late ones have an average of about 1100 cc (Leakey 1994). Some Asian *erectus* skulls have a sagittal crest. The skeleton is more robust than those of modern humans, implying greater strength. Body proportions vary; the Turkana Boy is tall and slender, like modern humans from the same area, while the few limb bones found of Peking Man indicate a shorter, sturdier build. Study of the Turkana Boy skeleton indicates that *erectus* may have been more efficient at walking than modern humans, whose skeletons have had to adapt to allow for the birth of larger-brained infants (Willis 1989). *Homo habilis* and all the australopithecines are found only in Africa, but *erectus* was wide-ranging, and has been found in Africa, Asia, and Europe. There is evidence that *erectus* probably used fire, and their stone tools are more sophisticated than those of *habilis*.

Homo sapiens (archaic)

Archaic forms of *Homo sapiens* first appear about 500,000 years ago. The term covers a diverse group of skulls which have features of both *Homo erectus* and modern humans. The brain size is larger than *erectus* and smaller than most modern humans, averaging about 1200 cc, and the skull is more rounded than in *erectus*. The skeleton and teeth are usually less robust than erectus, but more robust than modern humans. Many still have large brow ridges and receding foreheads and chins. There is no clear dividing line between late *erectus* and archaic *sapiens*, and many fossils between 500,000 and 200,000 years ago are difficult to classify as one or the other.

Homo sapiens neanderthalensis (was *Homo neanderthalensis*)

Neandertal man existed between 230,000 and 30,000 years ago. The average brain size is slightly larger than that of modern humans, about 1450 cc, but this is probably correlated with their greater bulk. The brain case however is longer and lower than that of modern humans, with a marked bulge at the back of the skull. Like *erectus*, they had a protruding jaw and receding forehead. The chin was usually weak. The midfacial area also protrudes, a feature that is not found in *erectus* or *sapiens* and may be an adaptation to cold. There are other minor anatomical

differences from modern humans, the most unusual being some peculiarities of the shoulder blade, and of the pubic bone in the pelvis. Neandertals mostly lived in cold climates, and their body proportions are similar to those of modern cold-adapted peoples: short and solid, with short limbs. Men averaged about 168 cm (5'6") in height. Their bones are thick and heavy, and show signs of powerful muscle attachments. Neandertals would have been extraordinarily strong by modern standards, and their skeletons show that they endured brutally hard lives. A large number of tools and weapons have been found, more advanced than those of *Homo erectus*. Neandertals were formidable hunters, and are the first people known to have buried their dead, with the oldest known burial site being about 100,000 years old. They are found throughout Europe and the Middle East. Western European Neandertals usually have a more robust form, and are sometimes called "classic Neandertals". Neandertals found elsewhere tend to be less excessively robust. (Trinkaus and Shipman 1992; Trinkaus and Howells 1979; Gore 1996)

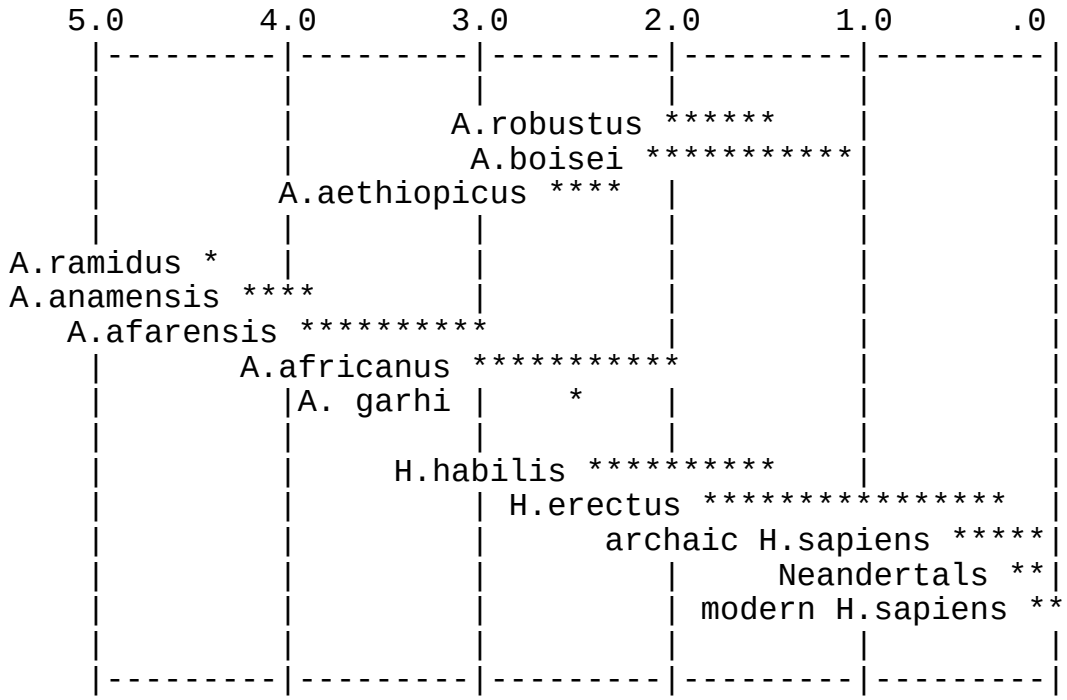
Homo sapiens sapiens (modern)

Modern forms of *Homo sapiens* first appear about 120,000 years ago. Modern humans have an average brain size of about 1350 cc. The forehead rises sharply, eyebrow ridges are very small or more usually absent, the chin is prominent, and the skeleton is very gracile. About 40,000 years ago, with the appearance of the Cro-Magnon culture, tool kits started becoming markedly more sophisticated, using a wider variety of raw materials such as bone and antler, and containing new implements for making clothing, engraving and sculpting. Fine artwork, in the form of decorated tools, beads, ivory carvings of humans and animals, clay figurines, musical instruments, and spectacular cave paintings appeared over the next 20,000 years. (Leakey 1994)

Even within the last 100,000 years, the long-term trends towards smaller molars and decreased robustness can be discerned. The face, jaw and teeth of Mesolithic humans (about 10,000 years ago) are about 10% more robust than ours. Upper Paleolithic humans (about 30,000 years ago) are about 20 to 30% more robust than the modern condition in Europe and Asia. These are considered modern humans, although they are sometimes termed "primitive". Interestingly, some modern humans (aboriginal Australians) have tooth sizes more typical of archaic *sapiens*. The smallest tooth sizes are found in those areas where food-processing techniques have been used for the longest time. This is a probable example of natural selection which has occurred within the last 10,000 years (Brace 1983).

Timeline

This diagram shows roughly the times during which each hominid species lived. Ages are in millions of years, with each character position representing 100,000 years. This resolution is a little coarse to accurately represent the most modern species.



http://www.talkorigins.org/faqs/homs/species.html, 04/28/97

Prominent Hominid Fossils

This list includes fossils that are important for either their scientific or historic interest, or because they are often mentioned by creationists. One sometimes reads that all hominid fossils could fit in a coffin, or on a table, or a billiard table. That is a misleading image, as there are now thousands of hominid fossils. They are however mostly fragmentary, often consisting of a single bone or isolated teeth. Complete skulls and skeletons are rare.

The list is sorted by species, going from older to more recent species. Within each species, finds are sorted by the order of their discovery. Each species has a type specimen which was used to define it.

Each entry will consist of a specimen number if known (or the site name, if many fossils were found in one place), any nicknames in quotes, and a species name. The species name will be followed by a '?' if suspect. If the fossil was originally placed in a different species, that name will also be given.

The following terminology is used. A skull refers to all the bones of the head. A cranium is a skull minus the lower jaw. A braincase is the cranium minus the face and upper jaw. A skullcap is the top portion of the braincase.

Abbreviations:	
ER	East (Lake) Rudolf, Kenya
WT	West (Lake) Turkana, Kenya
KP	Kanapoi, Kenya
SK	Swartkrans, South Africa
Sts,Stw	Sterkfontein, South Africa
TM	Transvaal Museum, South Africa
OH	Olduvai Hominid, Tanzania
AL	Afar Locality, Ethiopia
ARA-VP	Aramis Vertebrate Paleontology, Ethiopia
BOU-VP	Bouri Vertebrate Paleontology, Ethiopia

"ARA-VP, Sites 1, 6 & 7", *Ardipithecus ramidus*
Discovered by a team led by Tim White, Berhane Asfaw and Gen Suwa (1994) in 1992 and 1993 at Aramis in Ethiopia. Estimated age is 4.4 million years. The find consist of fossils from 17 individuals. Most remains are teeth, but there is also a partial lower jaw of a child, a partial cranium base, and partial arm bone from 2 individuals.
ARA-VP-6/1 consists of 10 teeth from a single individual.
ARA-VP-7/2 consists of parts of all three bones from the left arm of a single individual, with a mixture of hominid and ape features.

KP 271, "Kanapoi Hominid", *Australopithecus anamensis*
Discovered by Bryan Patterson in 1965 at Kanapoi in Kenya (Patterson and Howells 1967). This is a lower left humerus which is about 4.0 million years old. (Creationist arguments)

KP 29281, *Australopithecus anamensis*
Discovered by Peter Nzube in 1994 at Kanapoi in Kenya (Leakey et al. 1995). This is a lower jaw with all its teeth which is about 4.0 million years old.

KP 29285, *Australopithecus anamensis*
Discovered by Kamoya Kimeu in 1994 at Kanapoi in Kenya. This is a tibia, missing the middle portion of the bone, which is about 4.1 million years old. It is the oldest known evidence for hominid bipedalism.

AL 129-1, *Australopithecus afarensis*
Discovered by Donald Johanson in 1973 at Hadar in Ethiopia (Johanson and Edey 1981; Johanson and Taieb 1976). Estimated age is about 3.4 million years. This find consisted of portions of both legs, including a complete right knee joint which is almost a miniature of a human knee, but apparently belongs to an adult.

AL 288-1, "Lucy", *Australopithecus afarensis*
Discovered by Donald Johanson and Tom Gray in 1974 at Hadar in Ethiopia (Johanson and Edey 1981; Johanson and Taieb 1976). Its age is about 3.2 million years. Lucy was an adult female of about 25 years. About 40% of her skeleton was found, and her pelvis, femur (the upper leg bone) and tibia show her to have been bipedal. She was about 107 cm (3'6") tall (small for her species) and about 28 kg (62 lbs) in weight. (Creationist arguments)

AL 333 Site, "The First Family", *Australopithecus afarensis*?
Discovered in 1975 by Donald Johanson's team at Hadar in Ethiopia (Johanson and Edey 1981). Its age is about 3.2 million years. This find consisted of remains of at least 13 individuals of all ages. The size of these specimens varies considerably. Scientists debate whether the specimens belong to one species, two or even three. Johanson believes they belong to a single species in which males were considerably larger than females. Others believe that the larger specimens belong to a primitive species of *Homo*.

"Laetoli footprints", *Australopithecus afarensis*?
Discovered in 1978 by Paul Abell at Laetoli in Tanzania. Estimated age is 3.7 million years. The trail consists of the fossilized footprints of two or three bipedal hominids. Their size and stride length indicate that they were about 140 cm (4'8") and 120 cm (4'0") tall. Many scientists claim that the footprints are effectively identical to those of modern humans (Tattersall 1993; Feder and Park 1989), while others claim the big toes diverged slightly (like apes) and that the toe lengths are longer than humans but shorter than in apes (Burenhult 1993). The prints are tentatively assigned to *A. afarensis*, because no other hominid species is known from that time, although some scientists disagree with that classification. (Creationist arguments)

AL 444-2, *Australopithecus afarensis*
Discovered by Bill Kimbel and Yoel Rak in 1991 at Hadar in Ethiopia (Kimbel et al. 1994). Estimated age is 3 million years. This is a 70% complete skull of a large adult male, easily the most complete *afarensis* skull known, with a brain size of 550 cc. According to its finders, it strengthens the case that all the First Family fossils were members of the same species, because the differences between AL 444-2 and the smaller skulls in the collection are consistent with other sexually dimorphic hominoids.

"Taung Child", *Australopithecus africanus*
Discovered by Raymond Dart in 1924 at Taung in South Africa (Dart 1925). The find consisted of a full face, teeth and jaws, and an endocranial cast of the brain. It is between 2 and 3 million years old, but it and most other South African fossils are found in cave deposits that are difficult to date. The teeth of this skull showed it to be from an infant about 5 or 6 years old (it is now believed that australopithecines matured faster than humans, and that the Taung child was about 3). The brain size was 410 cc, and would have been around 440 cc as an adult. The large rounded brain, canine teeth which were small and not apelike, and the position of the foramen magnum(*) convinced Dart that this was a bipedal human ancestor, which he named *Australopithecus africanus* (African southern ape). Although the discovery became famous, Dart's interpretation was rejected by the scientific community until the mid-1940's, following the discovery of other similar fossils.

(*) Anatomical digression: the foramen magnum is the hole in the skull through which the spinal cord passes. In apes, it is towards the back of the skull, because of their quadrupedal posture. In humans it is at the bottom of the skull because our head is balanced on top of a vertical column. In australopithecines it is also placed forward from the ape position, although not always as far forward as in humans.

TM 1512, *Australopithecus africanus* (was *Plesianthropus transvaalensis*)
Discovered by Robert Broom in 1936 at Sterkfontein in South Africa (Broom 1936). The second australopithecine found, it consisted of parts of the face, upper jaw and braincase.

Sts 5, "Mrs Ples", *Australopithecus africanus*
Discovered by Robert Broom in 1947 at Sterkfontein in South Africa. It is a very well preserved cranium of an adult. It has usually been thought to be female, but there have been recent claims that it could be male. It is the best specimen of *africanus*. The brain size is about 485 cc.

Sts 14, *Australopithecus africanus*
Discovered by Robert Broom and J.T. Robinson in 1947 at Sterkfontein (Broom and Robinson 1947). Estimated age is about 2.5 million years. This find consisted of a nearly complete vertebral column, pelvis, some rib fragments, and part of a femur of a very small adult female. The pelvis is far more human than apelike, and is strong evidence that *africanus* was bipedal (Brace et al. 1979), although it may not have had the strong striding gait of modern humans (Burenhult 1993).

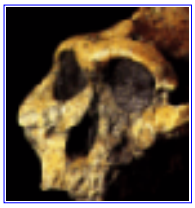
BOU-VP-12/130, *Australopithecus garhi*
Discovered by Y. Haile-Selassie in 1997 at Bouri in Ethiopia (Asfaw et al. 1999). This is a partial skull including an upper jaw with teeth which is about 2.5 million years old.

KNM-WT 17000, "The Black Skull", *Australopithecus aethiopicus*
Discovered by Alan Walker in 1985 near West Turkana in Kenya. Estimated age is 2.5 million years. This find is an intact, almost complete cranium. The brain size is very small for a hominid, about 410 cc, and the skull has a puzzling mixture of primitive and advanced features. (Leakey and Lewin 1992)

TM 1517, *Australopithecus robustus* (was *Paranthropus robustus*)
Discovered by a schoolboy, Gert Terblanche, in 1938 at Kromdraai in South Africa (Broom 1938). It consisted of skull fragments, including five teeth, and a few skeletal fragments. This was the first specimen of *robustus*.

SK 48, *Australopithecus robustus* (was *Paranthropus crassidens*)
Discovered by Mr. Fourie in 1950 at Swartkrans in South Africa (Johanson and Edgar 1996). It is a cranium, probably belonging to an adult female, and 1.5-2.0 million years old. It is the most complete skull of *robustus*.

OH 5, "Zinjanthropus", "Nutcracker Man", *Australopithecus boisei*
Discovered by Mary Leakey in 1959 at Olduvai Gorge in Tanzania (Leakey 1959). Estimated age is 1.8 million years. It is an almost complete cranium, with a brain size is about 530 cc. This was the first specimen of this species. Louis Leakey briefly considered this a human ancestor, but the claim was dropped when *Homo habilis* was found soon afterwards.



KNM-ER 406, *Australopithecus boisei*
Discovered by Richard Leakey in 1969 near Lake Turkana in Kenya. This find was a complete, intact cranium lacking only the teeth (Lewin 1987). Estimated age is about 1.7 million years. The brain size is about 510 cc. (see also ER 3733)

KNM-ER 732, *Australopithecus boisei*
Discovered by Richard Leakey in 1970 near Lake Turkana in Kenya. The cranium is similar to that of OH 5, but is smaller and has other differences such as the lack of a sagittal crest. The estimated age is about 1.7 million years. The brain size is about 500 cc. Most experts believe this is a case of sexual dimorphism, with the female being smaller than the male.

KGA10-525, *Australopithecus boisei*
Discovered by A. Amzaye in 1993 at Konso in Ethiopia (Suwa et al. 1997). This fossil consists of much of a skull, including a lower jaw. The estimated age is 1.4 million years. The brain size is estimated to be about 545 cc. Although it has many features specific to *boisei*, it also lies outside the previously known range of variation of that species in many ways, suggesting that *boisei* (and maybe other hominid species) may have been more variable than is often thought (Delson 1997).

Homo habilis
Discovered by the Leakeys in the early 1960's at Olduvai Gorge in Tanzania. A number of fragmentary specimens were found (Leakey et al. 1964).

- OH 7, "Jonny's Child", found by Jonathon Leakey in 1960 (Leakey 1961), consisted of a lower jaw and two cranial fragments of a child, and a few hand bones. Estimated age is 1.8 million years, and the brain size was about 680 cc.
- OH 8: found in 1960, consisted of a set of foot bones, complete except for the back of the heel and the toes. Estimated age is about 1.8 million years. They have a mixture of human and ape traits, but are consistent with bipedal locomotion. (Aiello and Dean 1990)

- OH 13, "Cindy": found in 1963, consisted of a lower jaw and teeth, bits of the upper jaw and a cranial fragment. Estimated age is 1.6 million years, and the brain size was about 650 cc.
- OH 16, "George": found in 1963, consisted of teeth and some very fragmentary parts of the skull. (George was unfortunately trampled by Masai cattle before he was found, and much of the skull was lost.) Estimated age is 1.7 million years, and the brain size was about 640 cc.

OH 24, "Twiggy", *Homo habilis*
Discovered by Peter Nzube in 1968 at Olduvai Gorge in Tanzania. It consisted of an fairly complete but very badly crushed cranium and seven teeth. It is about 1.85 million years old and has a brain size of about 590 cc.

KNM-ER 1470, *Homo habilis*
Discovered by Bernard Ngeneo in 1972 at Koobi Fora in Kenya (Leakey 1973). Estimated age is 1.9 million years. This is the most complete *habilis* skull known. Its brain size is 750 cc, large for *habilis*. It was originally dated at nearly 3 million years old, a figure that caused much confusion as at the time it was older than any known australopithecines, from whom *habilis* had supposedly descended. A lively debate over the dating of 1470 ensued (Lewin 1987; Johanson and Edey 1981; Lubenow 1992). The skull is surprisingly modern in some respects. The braincase is much larger and less robust than any australopithecine skull, and is also without the large brow ridges typical of *Homo erectus*. It is however very large and robust in the face. A number of leg bones were found within a couple of kilometers, and are thought to probably belong to the same species. The most complete, KNM-ER 1481, consisted of a complete left femur, both ends of a left tibia and the lower end of a left fibula (the smaller of the two lower leg bones). These are quite similar to the bones of modern humans. (Creationist arguments)

KNM-ER 1805, "The Mystery Skull", *Homo habilis*??
Discovered by Paul Abell in 1973 at Koobi Fora in Kenya (Leakey 1974). Estimated age is 1.85 million years. This find consisted of much of a heavily built cranium containing many teeth. Its brain size is about 600 cc. Some features, such as the sagittal crest, are typical of *A. boisei*, but the teeth are too small for that species. (Willis 1989; Day 1986) Various workers have assigned it to almost every conceivable species, but it seems most similar to *Homo habilis* (Wood 1991).

KNM-ER 1813, *Homo habilis*??
Discovered by Kamoya Kimeu in 1973 at Koobi Fora in Kenya (Leakey 1974). This specimen is similar to 1470, but is much smaller, with a brain size of 510 cc. Estimated age is 1.8-1.9 million years. Some scientists believe this a case of sexual dimorphism, others believe that the brain architecture is different and that 1813 is another species of *Homo*, and others believe it is an australopithecine. Like the previous skull, 1805, this one is in the "Suspense Account". (Willis 1989)

Stw 53, *Homo habilis*
Discovered by Alun Hughes in 1976 at Sterkfontein in South Africa (Hughes and Tobias 1977). Estimated age is 1.5 to 2 million years. It consisted of a number of cranium fragments including teeth. Many stone tools were found in the same layer.

OH 62, "Dik-dik hominid", *Homo habilis*
Discovered by Tim White in 1986 at Olduvai Gorge in Tanzania (Johanson and Shreeve 1989; Johanson et al. 1987). Estimated age is 1.8 million years. The find consisted of portions of skull, arm, leg bones and teeth. Almost all the features of the skull closely resemble *habilis* fossils such as OH 24, ER 1813 and ER 1470, rather than the australopithecines. But the estimated height is very small, maybe about 105 cm (3'5"), and the arms are very long in proportion to the legs. These are australopithecine traits, and in fact the skeletal bones are very similar to those of Lucy. This find is significant because it is the only fossil in which limb bones have been securely assigned to *habilis*. Because of the small size, this was almost certainly a female. As with the australopithecines, males would have been considerably larger.

Trinil 2, "Java Man", "Pithecanthropus I", *Homo erectus* (was *Pithecanthropus erectus*)
Discovered by Eugene Dubois in 1891 near Trinil on the Indonesian island of Java. Its age is uncertain, but thought to be about 700,000 years. This find consisted of a flat, very thick skullcap, a few teeth (which may belong to orang-utans). The following year a femur was found about 12 meters away (Theunissen 1989). The brain size is about 940 cc. Trinkaus and Shipman (1992) state that most scientists now believe the femur is that of a modern human, but few of the other references

mention this. (Creationist arguments)

"Heidelberg Man", "Mauer Jaw", *Homo erectus*? (was *Homo heidelbergensis*)
Discovered by gravel pit workers in 1907 near Heidelberg in Germany. Estimated age is between 400,000 and 700,000 years. This find consisted of a lower jaw with a receding chin and all its teeth. The jaw is extremely large and robust, like that of *Homo erectus*, but the teeth are at the small end of the *erectus* range. It is therefore identified as *erectus* on the basis of its age, but could be an archaic *sapiens*.

"Peking Man Site", *Homo erectus* (was *Sinanthropus pekinensis*)
Between 1929 and 1937, 14 partial craniums, 11 lower jaws, many teeth, some skeletal bones and large numbers of stone tools were discovered in the Lower Cave at Locality 1 of the Peking Man site at Zhoukoudian (formerly Choukoutien), near Beijing (formerly Peking), in China. Their age is estimated to be between 500,000 and 300,000 years old. (A number of fossils of modern humans were also discovered in the Upper Cave at the same site in 1933.) The most complete fossils, all of which were braincases or skullcaps, are:

- Skull III, discovered at Locus E in 1929 is an adolescent or juvenile with a brain size of 915 cc.
- Skull II, discovered at Locus D in 1929 but only recognized in 1930, is an adult or adolescent with a brain size of 1030 cc.
- Skulls X, XI and XII (sometimes called LI, LII and LIII) were discovered at Locus L in 1936. They are thought to belong to an adult man, an adult woman and a young adult, with brain sizes of 1225 cc, 1015 cc and 1030 cc respectively. (Weidenreich 1937)
- Skull V: two cranial fragments were discovered in 1966 which fit with (casts of) two other fragments found in 1934 and 1936 to form much of a skullcap with a brain size of 1140 cc. These pieces were found at a higher level, and appear to be more modern than the other skullcaps. (Jia and Huang 1990) (Creationist arguments)

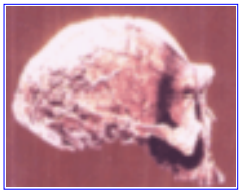
Most of the study on these fossils was done by Davidson Black until his death in 1934. Franz Weidenreich replaced him and studied the fossils until leaving China in 1941. The original fossils disappeared in 1941 while being shipped to the United States for safety during World War II, but excellent casts and descriptions remain. Since the war, other *erectus* fossils have been found at this site and others in China.

Sangiran 2, "Pithecanthropus II", *Homo erectus*
Discovered by G.H.R. von Koenigswald in 1937 at Sangiran on the Indonesian island of Java. This fossil is a braincase that is very similar to the first Java Man skull cap, but more complete and smaller, with a brain size of only about 815 cc.

OH 9, "Chellean Man", *Homo erectus*
Discovered by Louis Leakey in 1960 at Olduvai Gorge in Tanzania (Leakey 1961). Estimated age is 1.4 million years. It consisted of a partial braincase with massive browridges and a brain size of 1065 cc.

OH 12, "Pinhead", *Homo erectus*
Discovered by Margaret Cropper in 1962 at Olduvai Gorge in Tanzania. It is similar to but less complete than OH 9, and smaller, with an estimated brain size of only 750 cc. It is estimated to be between 600,000 and 800,000 years old.

Sangiran 17, "Pithecanthropus VIII", *Homo erectus*
Discovered by Sastrohamidjojo Sartono in 1969 at Sangiran on Java. This consists of a fairly complete cranium, with a brain size of about 1000 cc. It is the most complete *erectus* find from Java. This skull is very robust, with a slightly projecting face and huge flaring cheekbones. It has been thought to be about 800,000 years old, but a recent dating has given a much older figure of nearly 1.7 million years. If the older date is correct, it means *Homo erectus* migrated out of Africa much earlier than previously thought.



KNM-ER 3733, *Homo erectus*
Discovered by Bernard Ngeneo in 1975 at Koobi Fora in Kenya. Estimated age is 1.7 million years. This superb find consisted of an almost complete cranium. The brain size is about 850 cc, and the whole skull is similar to the Peking Man fossils. The discovery of this fossil in the same stratum as ER 406 (*A. boisei*) delivered the coup de grace to the single species hypothesis: the idea that there has never been more than one hominid species at any point in history. (Leakey and Walker 1976)

KNM-WT 15000, "Turkana Boy", *Homo erectus*
Discovered by Kamoya Kimeu in 1984 at Nariokotome near Lake Turkana in Kenya (Brown et al. 1985; Leakey and Lewin 1992; Walker and Leakey 1993; Walker and Shipman 1996). This is an almost complete skeleton of an 11 or 12 year old boy, the only major omissions being the hands and feet. (Some scientists believe *erectus* matured faster than modern humans, and that he was really about 9 years old (Leakey and Lewin 1992).) It is the most complete known specimen of *erectus*, and also one of the oldest, at 1.6 million years. The brain size was 880 cc, and it is estimated that it would have been 910 cc at adulthood. The boy was 160 cm (5'3") tall, and would have been about 185 cm (6'1") as an adult. This is surprisingly tall, indicating that many *erectus* may have been as large as modern humans. Except for the skull, the skeleton is very similar to that of modern boys, although there are a number of small differences.

"Rhodesian Man", *Homo sapiens* (archaic) (was Homo rhodesiensis)
Discovered by a laborer in 1921 at Broken Hill in Northern Rhodesia (now Kabwe in Zambia) (Woodward 1921). This was a complete cranium that was very robust, with large brow ridges and a receding forehead. Estimated age is between 200,000 and 125,000 years. The brain size was about 1280 cc. (Creationist arguments)

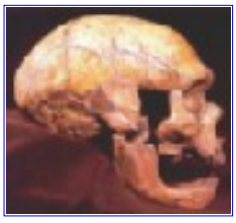
Petralona 1, *Homo sapiens* (archaic)
Discovered by villagers at Petralona in Greece in 1960. Estimated age is 250,000-500,000 years. It could alternatively be considered to be a late *Homo erectus*, and also has some Neandertal characteristics. The brain size is 1220 cc, high for *erectus* but low for *sapiens*, and the face is large with particularly wide jaws. (Day 1986)

Neanderthal 1, *Homo sapiens neanderthalensis*
Discovered by Johann Fuhlrott in 1856 in the Neander valley in Germany. The find consisted of a skullcap, thigh bones, part of a pelvis, some ribs, and some arm and shoulder bones. The lower left arm had been broken in life, and as a result the bones of the left arm were smaller than those of the right. Fuhlrott recognized it as a primitive human, but the German establishment headed by Rudolf Virchow rejected this view, incorrectly claiming that it was a pathological modern human. (Trinkaus and Shipman 1992) (Creationist arguments)

(There were actually two earlier Neandertal finds. A partial cranium of a 2.5 year old child found in 1829 in Belgium was not recognized until 1936. An adult cranium found on Gibraltar in 1848 gathered dust in a museum until it was recognized as Neandertal in 1864.)

"Spy 1 and 2", *Homo sapiens neanderthalensis*
Discovered by Marcel de Puydt and Max Lohest in 1886 at Spy (pronounced Spee) d'Orneau in Belgium. Estimated age is about 60,000 years. This find consisted of two almost complete skeletons. The excellent descriptions of the skeletons established that they were very old, and largely discredited the idea that the Neandertal physique was a pathological condition, but also erroneously concluded that Neandertal Man walked with bent knees.

"Krapina Site", *Homo sapiens neanderthalensis*
Discovered by Dragutin Gorjanovic-Kramberger in 1899 near Krapina in Croatia. This site yielded significant remains from two to three dozen individuals, and teeth and jaw fragments from dozens more. When Gorjanovic published on his finds in 1906, it confirmed for once and for all that Neandertals were not pathological modern humans.



"Old Man", *Homo sapiens neanderthalensis*
Discovered by Amedee and Jean Bouyssonie in 1908 near La-Chapelle-aux-Saints in France. It is about 50,000 years old, with a brain size of 1620 cc. This nearly complete skeleton was reconstructed by Marcellin Boule, who wrote a definitive and highly influential paper on it which managed to be totally wrong in many of its conclusions. It exaggerated the apelike characteristics of the fossil, popularizing the stereotype, which would last for decades, of a stooping ape-man shuffling along on bent knees. This specimen was between about 30 and 40 when he died, but had a healed broken rib, severe arthritis of the hip, lower neck, back and shoulders, and had lost most of his molar teeth. The fact that he survived as long as he did indicates that Neandertals must have had a complex social structure.

"Shanidar Site", *Homo sapiens neanderthalensis*
Ralph Solecki discovered 9 Neandertal skeletons between 1953 and 1960 at the Shanidar cave in Iraq. They are thought to be between 70,000 and 40,000 years old. One of them, Shanidar 4, had apparently been buried with offerings of flowers (although this interpretation has been disputed). In 1971 Solecki wrote a book, "Shanidar, the First Flower People", reversing the earlier stereotypes of semi-human brutes. Another skeleton, Shanidar 1, was partially blind, one-armed and crippled. His survival also is evidence of a complex social structure.

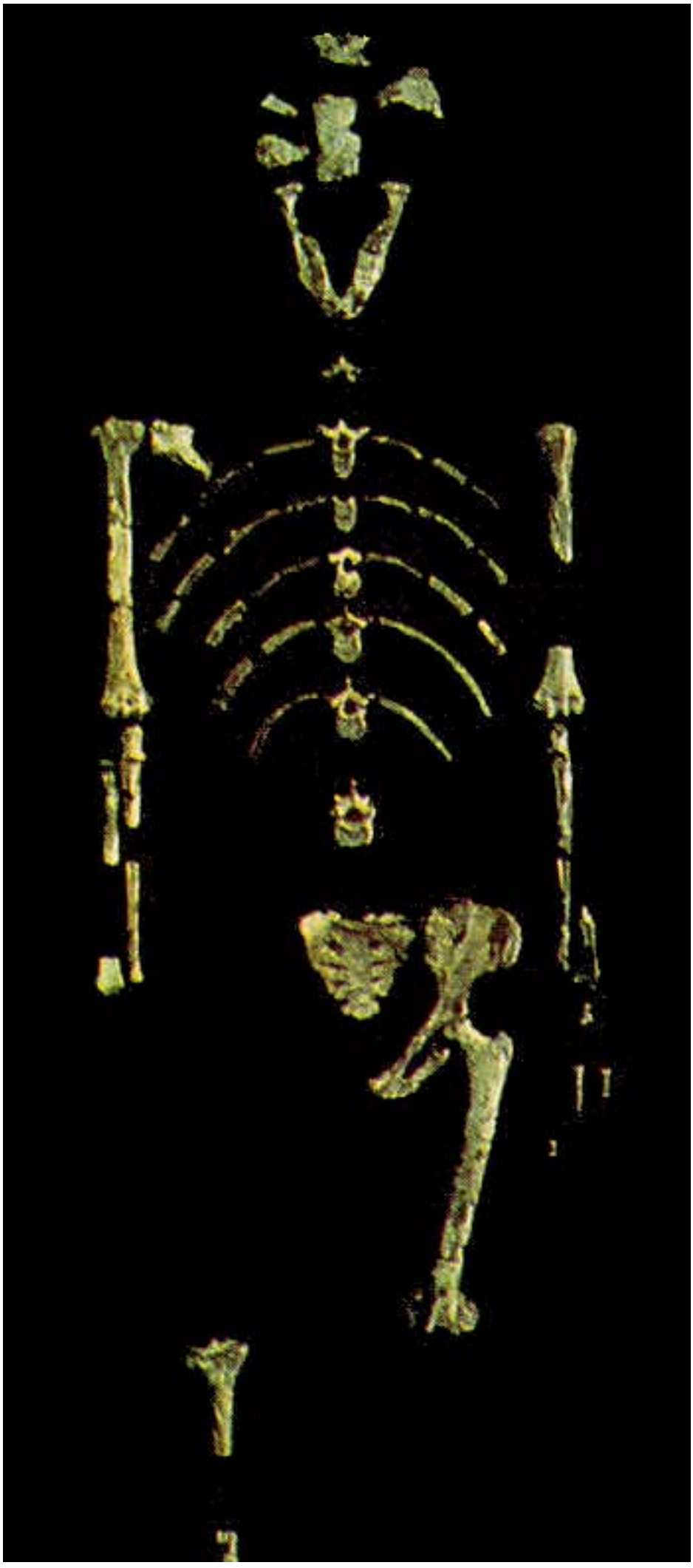
"Saint-Cesaire Neandertal", *Homo sapiens neanderthalensis*
Discovered by Francois Leveque in 1979 near the village of Saint-Cesaire in France. It consisted of a badly crushed skeleton. The skull was mostly complete, with only the back of the cranium missing. It is dated at about 35,000 years old, and is one of the latest Neandertals known. This find was of special interest because it was found with tools that had previously been assumed to belong to the Cro-Magnon culture, instead of the usual Neandertal tool kit.

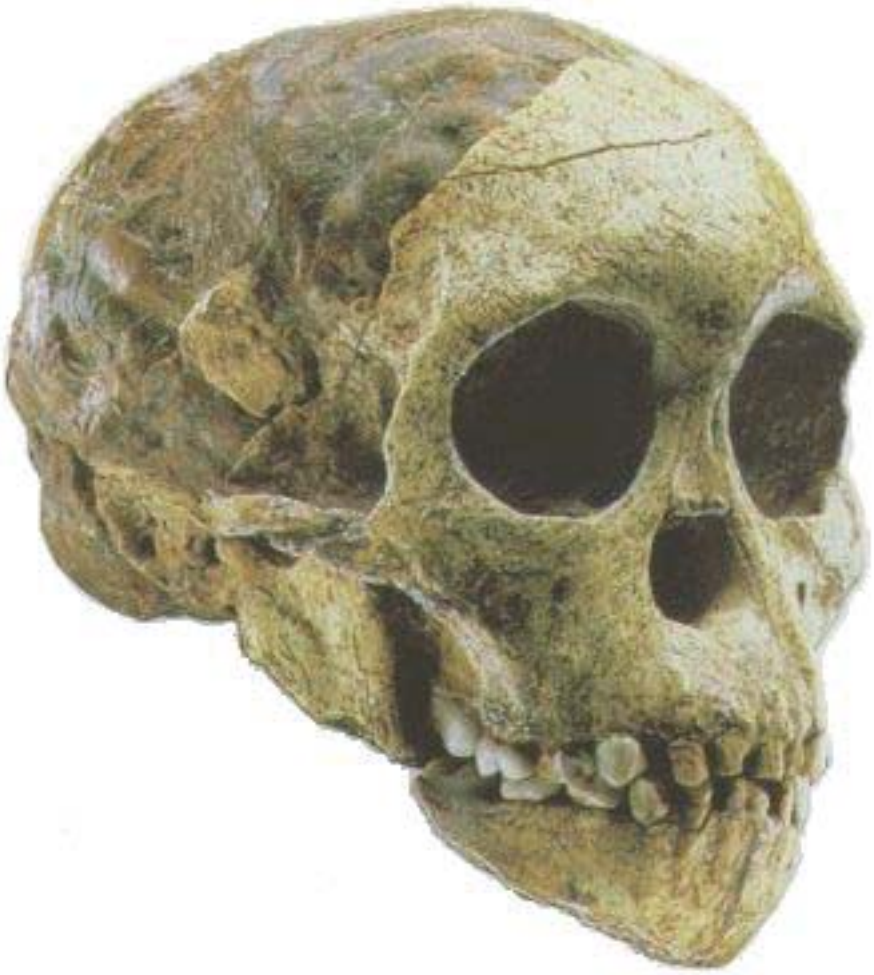
"Cro-Magnon Site", *Homo sapiens sapiens* (modern)
Discovered by workmen in 1868 at Cro-Magnon in France. Estimated age is 28,000 years. The site yielded skeletons of about half a dozen individuals, along with stone tools, carved reindeer antlers, ivory pendants, and shells. The Cro-Magnons lived in Europe between 35,000 and 10,000 years ago. They are virtually identical to modern man, being tall and muscular and slightly more robust than most modern humans. They were skilled hunters, toolmakers and artists famous for the cave art at places such as Lascaux, Chauvet, and Altamira.

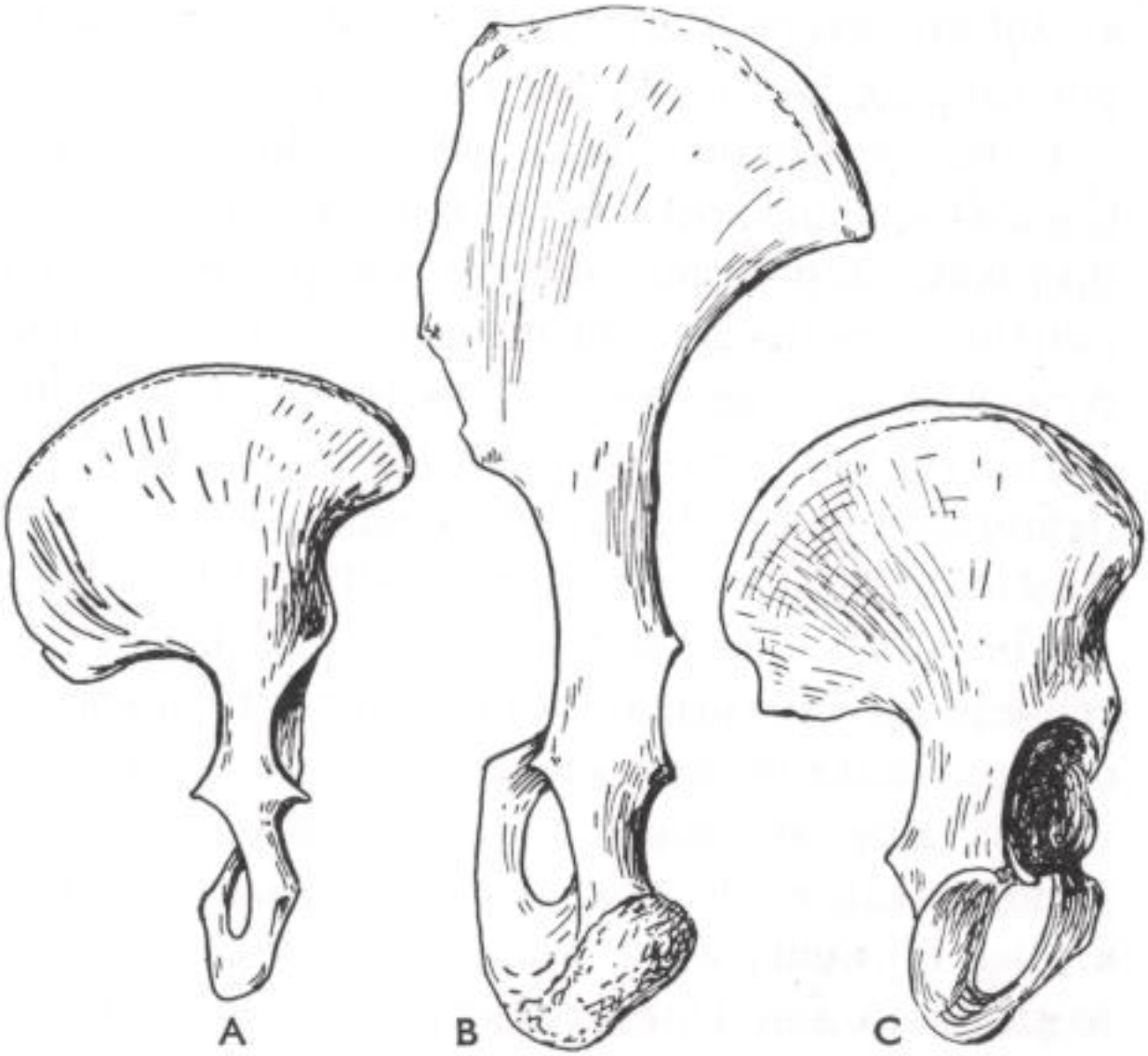
Summary

There are a number of clear trends (which were neither continuous nor uniform) from early australopithecines to recent humans: increasing brain size, increasing body size, increasing use of and sophistication in tools, decreasing tooth size, decreasing skeletal robustness. There are no clear dividing lines between some of the later gracile australopithecines and some of the early *Homo*, between *erectus* and archaic *sapiens*, or archaic *sapiens* and modern *sapiens*.

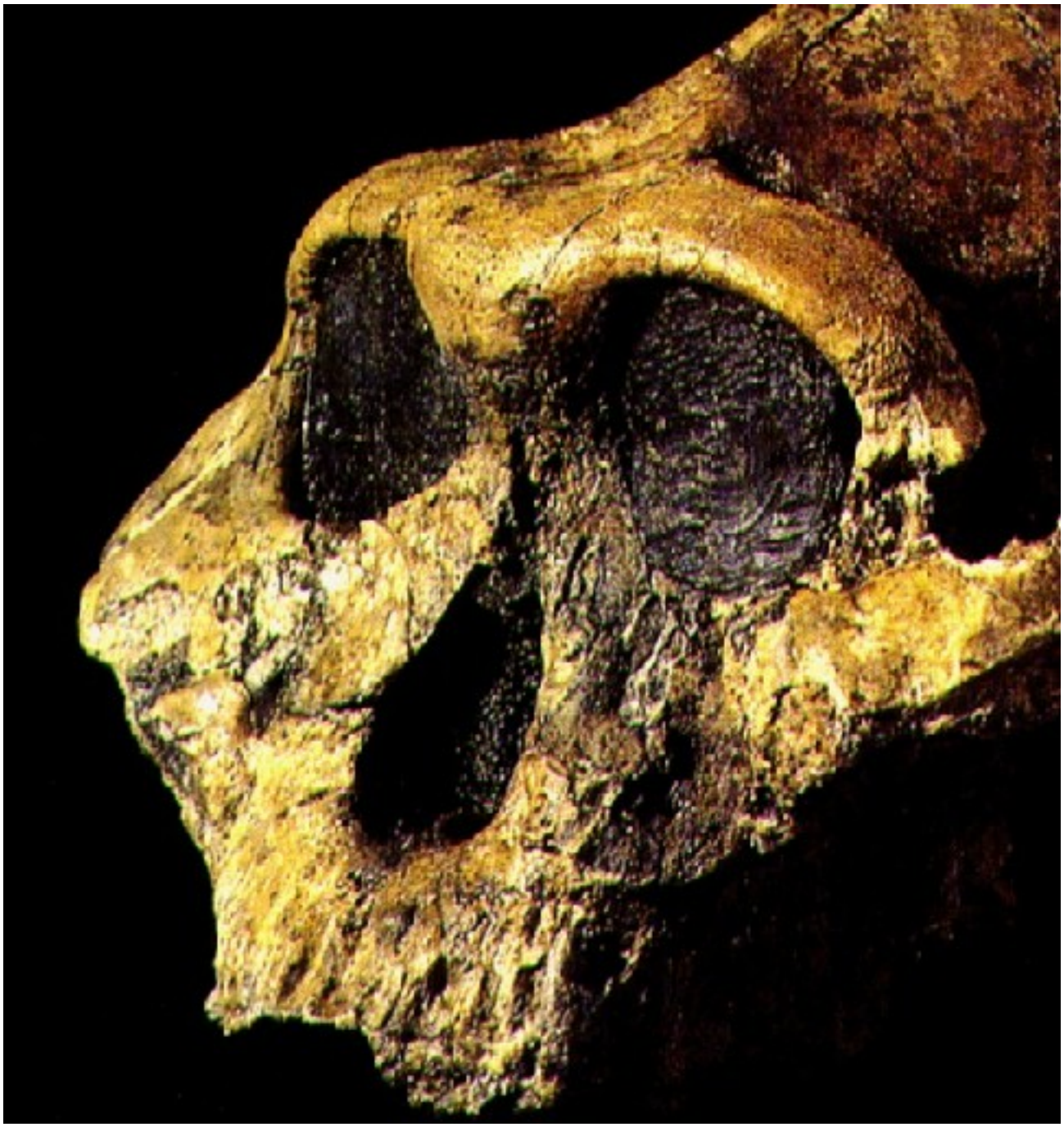
Despite this, there is little consensus on what our family tree is. Everyone accepts that the robust australopithecines (*aethiopicus*, *robustus* and *boisei*) are not ancestral to us, being a side branch that left no descendants. Whether *H. habilis* is descended from *A. afarensis*, *africanus*, both of them, or neither of them, is still a matter of debate. It is possible that none of the known australopithecines is our ancestor. The discoveries of *A. ramidus* and *A. anamensis* are so recent that it is hard to say what effect they will have on current theories. It is generally accepted that *Homo erectus* is descended from *Homo habilis* (or, at least, some of the fossils currently assigned to *habilis*), but the relationship between *erectus*, *sapiens* and the Neandertals is still unclear. Neandertal affinities can be detected in some specimens of both archaic and modern *sapiens*.







57 Comparison between the right iliac bone of: A, *Plesianthropus;* B, Chimpanzee; C, young Bushman. One-quarter natural size. (After Broom and Robinson)



Skull OH 24

OH 24, "Twiggy", *Homo habilis*

Discovered by Peter Nzube in 1968 at Olduvai Gorge in Tanzania. It consisted of a badly crushed skull and seven teeth. It is about 1.8 million years old and has a brain size of about 590 cc.

This is the most complete of the *Homo habilis* skulls discovered at Olduvai Gorge. (It is not as complete as it may look above; the lighter portion of the side of the head is filler.) When discovered, it had been crushed absolutely flat, hence the nickname "Twiggy", after an English model of the 1960's. A heroic reconstruction job by R.J. Clarke restored it, but some distortion undoubtedly remains.

This page is part of the Fossil Hominids FAQ at the talk.origins Archive.

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http://www.talkorigins.org/faqs/homs/oh24.html, 04/28/97

Skull KNM-ER 1470

KNM-ER 1470, *Homo habilis*

Discovered by Bernard Ngeneo in 1972 at Koobi Fora in Kenya (Leakey, 1973). Estimated age is 1.9 million years. This is the most complete *habilis* skull known. Its brain size is 750 cc, large for *habilis*. It was originally dated at nearly 3 million years old, a figure that caused much confusion as at the time it was older than any known australopithecines, from whom *habilis* had supposedly descended. A lively debate over the dating of 1470 ensued (Lewin, 1987; Johanson and Edey, 1981; Lubenow, 1992). The braincase is surprisingly modern in many respects, much less robust than any australopithecine skull, and also without the robustness and large brow ridges typical of *Homo erectus*. The face, in contrast, is extremely large and robust.

In the last few years, an increasing number of scientists have been classifying this skull as *Homo rudolfensis*.

Most creationists consider 1470 to be a modern human skull. Duane Gish thinks it belongs to an ape (although he used to think it was a human skull).

Creationist arguments about 1470

Compare ER 1470 to ER 1813

Offsite: two good photos of ER 1470 from the Hominid Palaeontology Research Group at the University of Liverpool:

- 1470 front view (183k)
- 1470 3/4 view (141k)

Offsite: Shockwave comparison of ER 1470 with a modern human skull

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http://www.talkorigins.org/faqs/homs/1470.html, 04/28/97

Skull KNM-ER 1813

KNM-ER 1813, *Homo habilis*??

Discovered by Kamoya Kimeu in 1973 at Koobi Fora in Kenya (Leakey, 1974). This specimen is similar to 1470, but is much smaller, with a brain size of 510 cc. Estimated age is 1.8-1.9 million years.

Apart from its extremely small size, ER 1813 is quite similar to a number of *Homo erectus* and *Homo habilis* skulls. It is surprisingly modern, with a rounded skull, no sagittal crest, modest eyebrow ridges, and a small amount of nasal prominence. Creationists almost totally ignore the existence of this fossil (Lubenow briefly mentions it without describing it). However it is safe to say that all creationists would classify it as an ape; its brain size of 510 cc is far too small to be considered human.

Compare ER 1813 with ER 1470

Creationist arguments about *Homo habilis*

Offsite: Shockwave comparison of ER 1813 with a modern human skull

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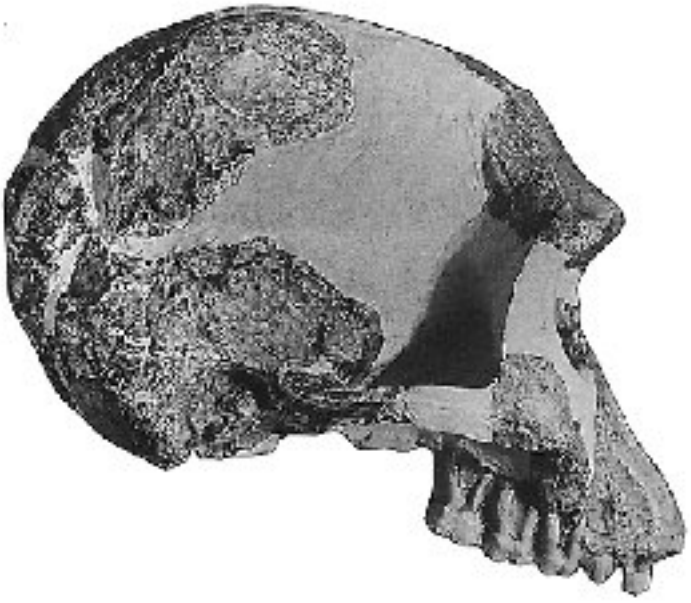
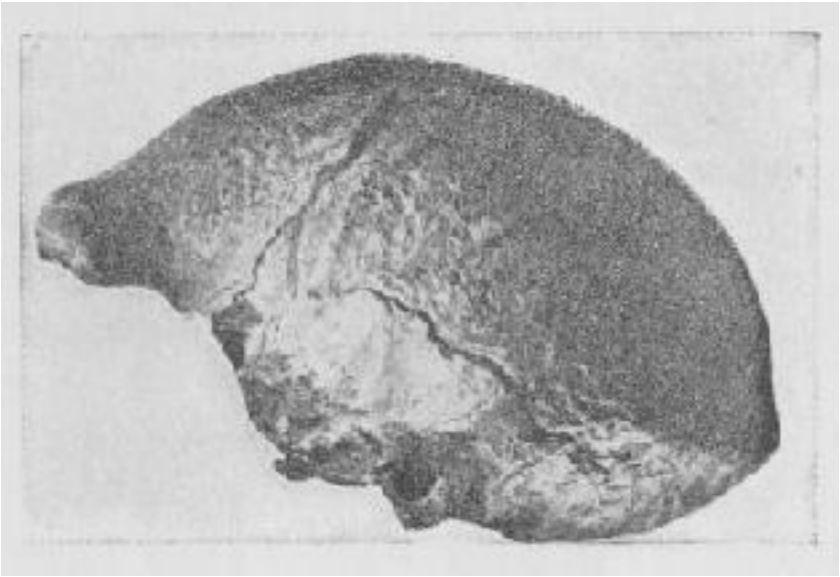
http://www.talkorigins.org/faqs/homs/1813.html, 04/28/97



The Java Man skullcap

Trinil 2, "Java Man", "Pithecanthropus I", *Homo erectus* (was Pithecanthropus erectus)

Discovered by Eugene Dubois in 1891 near Trinil in Java. Its age is uncertain, but thought to be about 700,000 years. This find consisted of a flat, very thick skullcap, a few teeth, and a thigh bone found about 12 meters away (Theunissen, 1989). The brain size is about 940 cc. Trinkaus and Shipman (1992) state that most scientists now believe the femur is that of a modern human, but few of the other references mention this.



Sangiran 2, "Pithecanthropus II", *Homo erectus*
A very similar but more complete braincase was found at Sangiran in Java in 1937 by G.H.R. von Koenigswald. It is even smaller, with a brain size of only 815 cc.

Almost all creationists consider Java Man to be a large ape, but it is far more humanlike and has a far larger brain size than any ape.

Creationist arguments about Java Man

Compare Java Man with the Turkana Boy

Compare Java Man with a chimpanzee and a Neandertal

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http://www.talkorigins.org/faqs/homs/java.html, 04/28/97

Heidelberg Man

"Heidelberg Man", "Mauer Jaw", *Homo erectus*? (was *Homo heidelbergensis*)

Discovered by gravel pit workers in 1907 near Heidelberg in Germany. Estimated age is between 400,000 and 700,000 years. This find consisted of a lower jaw with a receding chin and all its teeth. The jaw is extremely large and robust, like that of *Homo erectus*, but the teeth are at the small end of the *erectus* range. It is therefore identified as *erectus* on the basis of its age, but could be an archaic *sapiens*.

The above photograph compares the Heidelberg jaw (left) with the jaw of a modern human (right). Suffice it to say that the owner of this jaw would *definitely* attract more attention than the average traveller on the New York subway.

This photograph is from "Humankind Emerging", edited by Bernard Campbell.

Peking Man

"Peking Man", *Homo erectus* (was Sinanthropus pekinensis)

Between 1929 and 1937, 14 partial craniums, 11 lower jaws, many teeth, some skeletal bones and large numbers of stone tools were discovered in the Lower Cave at Locality 1 of the Peking Man site at Zhoukoudian, near Beijing, in China. Their age is estimated to be between 500,000 and 300,000 years old.

The illustration is of a reconstruction done by Franz Weidenreich, based on bones from at least four different individuals (none of the fossils were this complete).

Most creationists have considered the Peking Man fossils to be those of apes, or, even more improbably, monkeys, but recently the view of Lubenow that they were humans has been gaining ground.

Creationist arguments about Peking Man

Compare Peking Man with *Homo erectus*

Offsite: Fossil Evidence for Human Evolution in China (lots of excellent material, including a page with pictures and descriptions of some of the Peking Man fossils)

Offsite: A New Reconstruction of *Sinanthropus*

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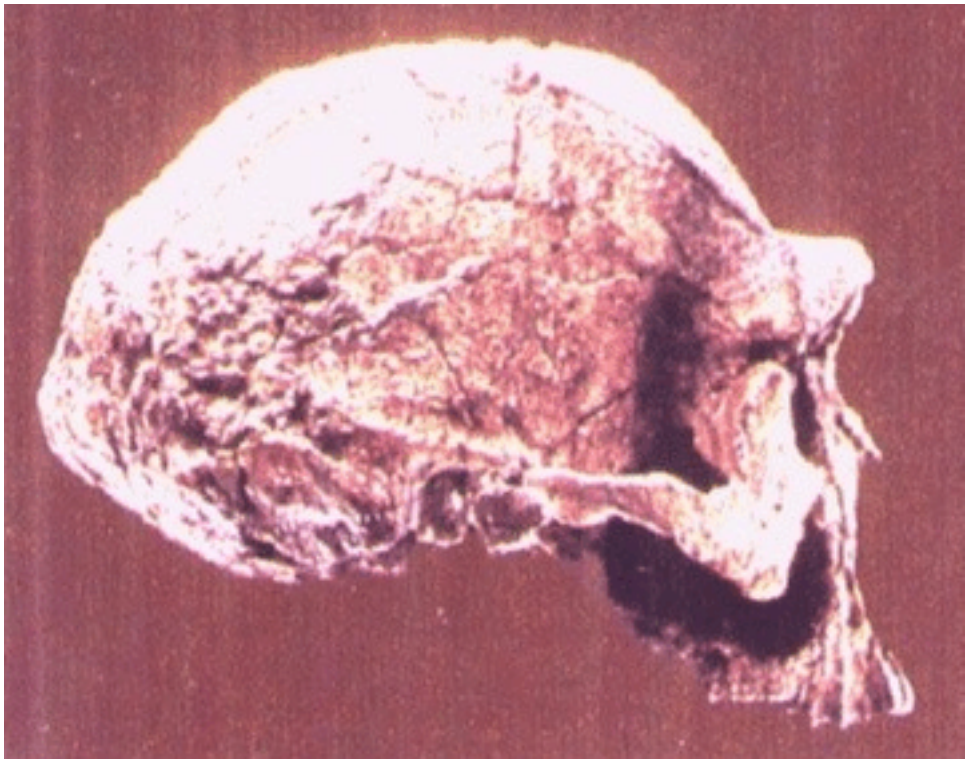
http://www.talkorigins.org/faqs/homs/peking.html, 04/28/97

Skull KNM-ER 3733



KNM-ER 3733, *Homo erectus*

Discovered by Bernard Ngeneo in 1975 at Koobi Fora in Kenya. Estimated age is 1.7 million years. This superb find consisted of an almost complete cranium. The brain size is about 850 cc, and the whole skull is similar to some of the Peking Man fossils.

The brain size of 850 cc is extremely small by modern standards. A very similar skull, ER 3883, is even smaller, at 800 cc.

Creationist arguments about *Homo erectus*

Offsite: Shockwave comparison of ER 3733 with a modern human skull

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KNM-WT 15000 (Turkana Boy)

KNM-WT 15000, "Turkana Boy", *Homo erectus*

Discovered by Kamoya Kimeu in 1984 at Nariokotome near Lake Turkana in Kenya (Brown et al.1985; Leakey and Lewin, 1992; Walker and Leakey, 1993). This is an almost complete skeleton of an 11 or 12 year old boy, the only major omissions being the hands and feet. (Some scientists believe *erectus* matured faster than modern humans, and that he was really about 9 years old (Leakey and Lewin 1992).) It is the most complete known specimen of *H. erectus*, and also one of the oldest, at 1.6 million years. The brain size was 880 cc, and it is estimated that it would have been 910 cc at adulthood. The boy was 160 cm (5'3") tall, and would have been about 185 cm (6'1") as an adult.

In the 1988 video Mysteries of Mankind, produced by National Geographic, Richard Leakey talks about this fossil:

> "I think [the Turkana Boy] is remarkable because it's so complete, but perhaps another aspect that is often overlooked is that many people who don't like the idea of human evolution have been able to discount much of the work that we've done on the basis that it's built on fragmentary evidence. There have just been bits and pieces, and who knows, those little bits of bone could belong to anything. To confront some of these people with a complete skeleton that is human and is so obviously related to us in a context where it's definitely one and a half million years or even more is fairly convincing evidence, and I think many of the people who are fence-sitters on this discussion about creationism vs. evolution are going to have to get off the fence in the light of this discovery."

Creationist arguments about *Homo erectus*

Compare the Turkana Boy with Java Man

Compare the Turkana Boy with Peking Man

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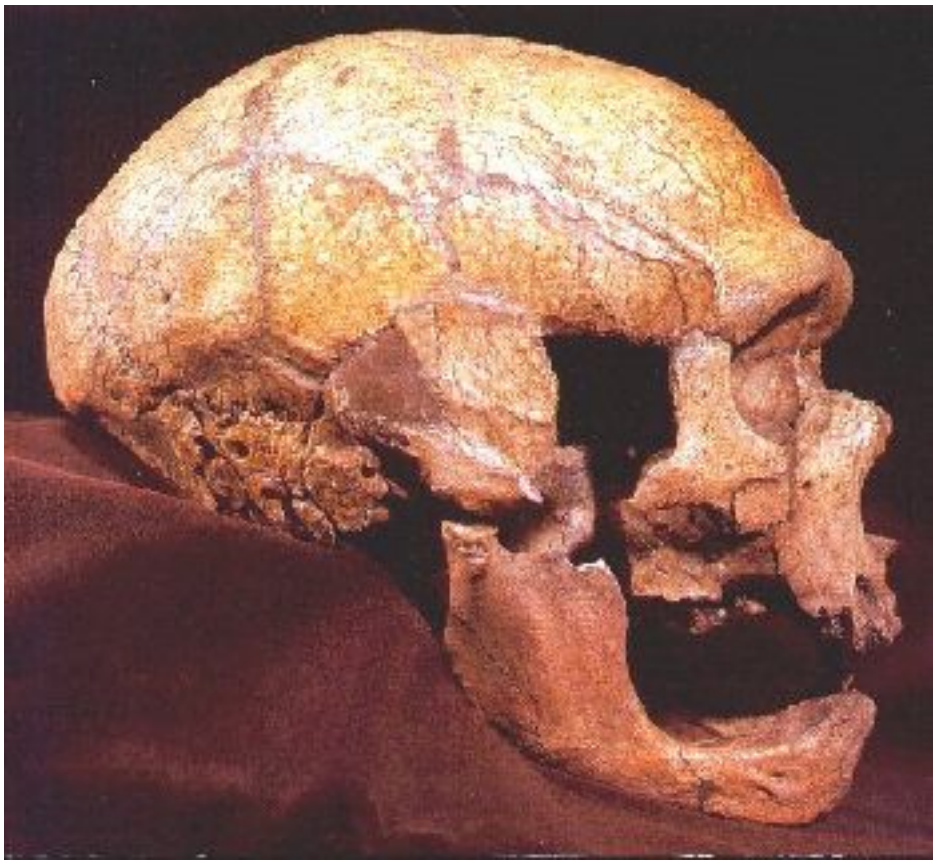
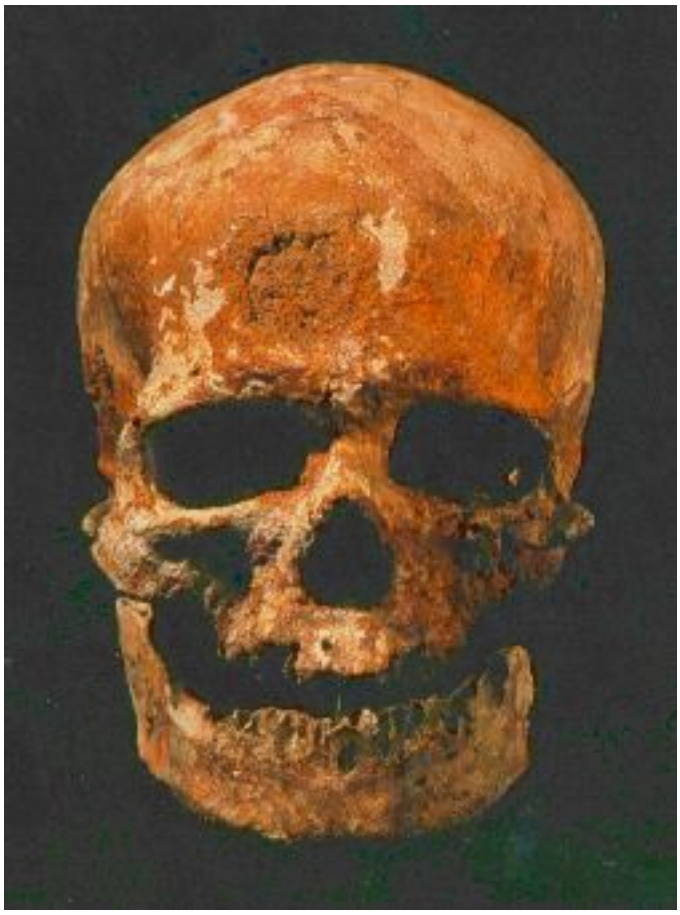




Recent Developments in Paleoanthropology

These pages use a fairly conservative naming system. In recent years a number of changes have been suggested in the classification of hominid fossils.

Many people are now using the genus name *Paranthropus*, originally given to *robustus*, to refer to the robust australopithecines (*robustus*, *boisei*, and *aethiopicus*). This change makes sense if all these species form a clade (all of the species descended from a common ancestor) but it is not yet known if this is the case.

Homo habilis is a controversial species, with much disagreement over which specimens belong in *habilis*, and which do not. A number of scientists now use the name *H. rudolfensis* to refer to ER 1470 and some similar fossils. The smaller *habilis*-like specimens such as ER 1813 and ER 1805 are variously assigned to *habilis*, *H. ergaster*, or to another as yet unnamed species. The name *H. microcranous* has been proposed for ER 1813, but does not seem to be widely used. Wood and Collard (1999) have argued on theoretical grounds that *H. habilis* and *H. rudolfensis* should be moved into the genus *Australopithecus*.

Some scientists have also proposed splitting *Homo erectus*. The Turkana Boy and ER 3733 fossils would then become *Homo ergaster* (Tattersall 1993). *H. erectus* would have a larger average brain size than *ergaster*, and the brow ridges may have a different shape, flaring out to the side more (Burenhult 1993).

It has also been proposed that the names *Homo heidelbergensis* and *Homo neanderthalensis* should be restored as species names for archaic *Homo sapiens* and the Neandertals. Recent claims of genetic and anatomical differences between modern humans and Neandertals have added support to a species status for *Homo neanderthalensis*. (Krings et al. 1997; Hublin et al. 1996; Tattersall and Schwartz 1996)

There are a number of other recent discoveries which may change current thinking when they have been fully analyzed (newest items are at the top of the list):

- A new species, *Australopithecus garhi*, has been named from fossils found near Bouri in Ethiopia, by a joint Ethiopian, American and Japanese team. This small-brained, large-toothed hominid was found near antelope bones which had been butchered by stone tools (Asfaw et al. 1999).
- According to Neandertal expert Erik Trinkaus, the 24500-year-old skeleton of a young boy found in Portugal contains characteristics of both modern human and Neandertals, and is evidence that the two groups interbred (Duarte et al. 1999.
- Although it has not yet been fully excavated, it seems that virtually an entire australopithecine skeleton has been discovered by Ronald Clarke at Sterkfontein in South Africa. This skeleton belongs to the same individual as the "Little Foot" set of four foot bones discovered by Clarke in 1994 (see below).
- An article by geographer Jerome Dobson (Geographical Review, Dec 1998) suggests that Neandertal features are caused by an iodine deficiency, or by a genetic difference in the thyroid. (Diseases associated with low-iodine diets are goiter and cretinism.) Expect this controversial claim to receive skeptical scrutiny from anthropologists, and uncritical acceptance from creationists.
- Analysis of new *A. africanus* fossils from Sterkfontein in South Africa suggests that the forelimb and hindlimb proportions of *africanus* were more ape-like than in the earlier *A. afarensis*. (McHenry and Berger 1998)
- A well-preserved *Homo* cranium discovered in Eritrea is about 1 million years old, and contains a mixture of *erectus* and *sapiens* characteristics. (Abbate et al. 1998)
- A new *A. boisei* skull is one of the most complete known, and the first known with an associated cranium and lower jaw. It also has a surprising amount of variability from other *boisei* skulls, which may have implications for how hominid fossils are classified. (Suwa et al. 1997; Delson 1997)
- In a stunning technical achievement, it appears that a portion of Neandertal mitochondrial DNA (mtDNA) has been successfully extracted for the first time. It differs by a surprising amount from equivalent modern human DNA, suggesting that Neandertals were not particularly closely related to any modern humans, and

supporting (but certainly not proving) claims that they were a different species. (Krings et al. 1997; Kahn and Gibbons 1997)

- Some *Homo* fossils found recently in Spain, and dated at over 780,000 years, are the oldest confirmed European hominids. It is not yet clear what species they belong to, although the discoverers have named them *Homo antecessor*. (Bermudez de Castro et al. 1997; Kunzig R.1997)
- The oldest known stone tools have been found in Ethiopia in sediments dated at between 2.5 and 2.6 million years old. The makers are unknown, but may be early *Homo*. (Semaw et al. 1997)
- An upper jaw belonging to the genus *Homo* and dated at over 2.3 million years old has been found in Ethiopia, associated with stone tools. (Kimbel et al. 1996)
- Recent studies claim that some Javan skulls are between 51,000 and 27,000 years old, far more recent than previously thought. If confirmed, it means that *Homo erectus* and *sapiens* co-existed in this region for some time. (Swisher et al. 1996)
- A partial jaw found in Chad (Central Africa) greatly extends the geographical range in which australopithecines are known to have lived. The specimen, which has been nicknamed Abel, has since been named *Australopithecus bahrelghazali*. (Brunet et al. 1995)
- Four australopithecine foot bones dated at around 3.5 million years are the oldest hominid fossils yet found in South Africa. They seem to be adapted to bipedalism, but have an intriguing mixture of ape and human features (Clarke and Tobias 1995). Since then, 8 more foot and leg bones have been found from the same individual, who has been nicknamed Little Foot.
- Recent finds at Zafarraya in Spain suggest that Neandertals may have survived longer than previously thought, perhaps as recently as 27,000 years ago.
- Two hominid teeth in a small jaw fragment found in China and dated at around 1.9 million years are claimed as evidence that *Homo* arrived in Asia earlier than currently thought. (However other researchers have suggested this is a fossil ape.) (Huang et al. 1995)
- Recent research suggests that the some australopithecines were capable of a precision grip, like that of humans but unlike apes, which would have meant they were capable of making stone tools. (Susman 1994)

References

Abbate E., Albianelli A., Azzaroli A., Benvenuti M., Tesfamariam B., Bruni P. et al. (1998): A one-million-year-old *Homo* cranium from the Danakil (Afar) depression of Eritrea. Nature, 393:458.

Asfaw B., White T.D., Lovejoy C.O., Suwa G., and Simpson S. (1999): *Australopithecus garhi*: a new species of early hominid from Ethiopia. Science, 284:629-35.

Bermudez de Castro J.M., Arsuaga J., Carbonell E., Rosas A., Martinez I., and Mosquera M. (1997): A hominid from the lower Pleistocene of Atapuerca, Spain: possible ancestor to Neandertals and modern humans. Science, 276:1392-5.

Brunet M., Beauvilain A., Coppens Y., Heintz E., Moutaye A.H.E., and Pilbeam D. (1995): The first australopithecine 2,500 kilometres west of the rift valley (Chad). Nature, 378:273-5.

Burenhult G. (1993): The first humans: human origins and history to 10,000 BC. New York: HarperCollins.

Clarke R.J. and Tobias P.V. (1995): Sterkfontein member 2 foot bones of the oldest South African hominid. Science, 269:521-4.

Delson E. (1997): One skull does not a species make. Nature, 389:445-6.

Duarte C., Mauricio J., Pettitt P.B., Souto P., Trinkaus E., van der Plicht H. et al. (1999): The early upper Paleolithic human skeleton from the Abrigo do Lagar Velho (Portugal) and modern human emergence in Iberia. Proceedings of the National Academy of Sciences, USA, 96:7604-9.

Huang W., Ciochon R., Gu Y., Larick R., Fang Q., Schwarcz H.P. et al. (1995): Early *Homo* and associated artefacts from Asia. Nature, 378:275-40.

Hublin J., Spoor F., Braun M., Zonneveld F., and Condemi S. (1996): A late neanderthal associated with upper palaeolithic artefacts. Nature, 381:224-6.

Kahn P. and Gibbons A. (1997): DNA from an extinct human. Science, 277:176-8.

Kimbel W.H., Walter R.C., Johanson D.C., Reed K.E., Aronson J.L., Assefa Z. et al. (1996): Late pliocene *Homo* and oldowan tools from the Hadar formation (kada hadar member), Ethiopia. Journal of Human Evolution, 31:549-61.

Krings M., Stone A., Schmitz R.W., Krainitzki H., Stoneking M., and Paabo S. (1997): Neandertal DNA sequences and the origin of modern humans. Cell, 90:19-30.

Kunzig R. (1997): The face of an ancestral child. Discover, 18, 88-101.

McHenry H.M., Berger L.R. (1998): Body proportions in *Australopithecus afarensis* and *A. africanus* and the origin of the genus *Homo*. Journal of Human Evolution, 35:1-22.

Semaw S., Renne P., Harris J.W.K., Feibel C.S., Bernor R.L., Fesseka N. et al. (1997): 2.5-million-year-old stone tools from Gona, Ethiopia. Nature, 385:333-6.

Susman R.L. (1994): Fossil evidence for early hominid tool use. Science, 265:1570-3.

Suwa G., Asfaw B., Beyene Y., White T.D., Katoh S., Nagaoka S. et al. (1997): The first skull of *Australopithecus boisei*. Nature, 389:489-92.

Swisher C.C. III, Rink W.J., Anton S.C., Schwarcz H.P., Curtis G., Supryo A., and Widiasmoro (1996): Latest *Homo erectus* of Java: potential contemporaneity with *Homo sapiens* in southeast Asia. Science 274:1870-1874.

Tattersall I. (1993): The human odyssey: four million years of human evolution. New York: Prentice Hall.

Tattersall I. and Schwartz J.H. (1996): Significance of some previously unrecognized apomorphies in the nasal region of *Homo neanderthalensis*. Proc.Natl.Acad.Sci.USA 93:10852-10854

Wood B.A. and Collard M. (1999): The human genus. Science, 284:65-71.

Creationist Arguments

The usual creationist response to these fossils is to claim that there are no intermediates; each one is either a human or an ape. It doesn't matter that some of the "humans" have a brain size well below the normal human range, heavy brow ridges, no chin, and teeth larger than modern ones set in a projecting jaw, or that some of the "apes" were bipedal, with very humanlike teeth, and brains larger than those of similar sized apes. There are some skulls which cannot be reliably assigned to either genus. (Willis 1989)

This is exactly what we would expect if evolution had occurred. If, on the other hand, creationism was true and there was a large gap between humans and apes, it should be easy to separate hominid fossils into humans and apes. This is not the case. As will be shown, creationists themselves cannot agree which fossils are humans and which are apes. It would not matter even if creationists *could* decide where to put the dividing line between humans and apes. No matter where it is placed, the humans just above the line and the apes just below it will be more similar to one another than they will be to other humans or other apes.

The following sections deal only with the arguments of young-earth creationists, who hold to a very rigid literal interpretation of the Bible. They typically believe that the earth was created less than 20,000 years ago, in the space of six 24-hour days. Old-earth creationists usually accept the age of the earth given by geologists (4.6 billion years), but differ considerably in their acceptance of the theory of evolution.

Debates

Creationists like to claim that there is no evidence for human evolution. Ask them to back that up by discussing specific fossils, however, and they go into frantic evasive maneouvers. Here are a number of online discussions I have had with creationists.

- Richard Milton. This email debate between Milton and myself discussed the validity of the evidence for human evolution.
- Karl Crawford. In this exchange on the talk.origins newsgroup, I attempted to get Karl (aka ksjj) to address the evidence he had repeatedly asked for.
- Ted Holden. Ted has a distinctive 'hit and run' style of debating.
- Ed Conrad. Ed asked what the evidence for human evolution was, but didn't seem very interested when shown it.

Creationist Arguments: Australopithecines

In 1950, Wilfred Le Gros Clark published a paper which definitively settled the question of whether the australopithecines were apes or not. He performed a morphological study (based on the shape and function) of teeth and jaws, since these formed most of the fossil evidence. By studying human and modern ape fossils, Le Gros Clark came up with a list of eleven consistent differences between humans and apes. Looking at *A. africanus* and *robustus* (the only australopithecine species then known), he found that they were humanlike rather than apelike in every characteristic. Judged by the same criteria, *A. afarensis* falls somewhere between humans and apes, and possibly closer to the apes (Johanson and Edey 1981). White et al. (1994) did not judge *A. ramidus* by these criteria, but it is clear that *ramidus* is even more chimpanzee-like than *afarensis*. The *ramidus* arm bones also display a mixture of hominid and ape characteristics.

Solly Zuckerman attempted to prove with biometrical studies (based on measurements) that the australopithecines were apes. Zuckerman lost this debate in the 1950's, and his position was abandoned by everyone else (Johanson and Edey 1981). Creationists like to quote his opinions as if they were still a scientifically acceptable viewpoint.

Charles Oxnard (1975), in a paper that is widely cited by creationists, claimed, based on his multivariate analyses, that australopithecines are no more closely related, or more similar, to humans than modern apes are. Howell et al.(1978) criticized this conclusion on a number of grounds. Oxnard's results were based on measurements of a few skeletal bones which were usually fragmentary and often poorly preserved. The measurements did not describe the complex shape of some bones, and did not distinguish between aspects which are important for understanding locomotion from those which were not. Finally, there is "an overwhelming body of evidence", based on the work of nearly 30 scientists, which contradicts Oxnard's work. These studies used a variety of techniques, including those used by Oxnard, and were based on many different body parts and joint complexes. They overwhelmingly indicate that australopithecines resemble humans more closely than the living apes.

Creationists often cite Oxnard's qualifications, and use of computers to perform his calculations, with approval. This is special pleading; many other scientists are equally qualified, and also use computers. Gish (1993) states that "[a] computer doesn't lie, [a] computer doesn't have a bias". True enough, but the results that come out of a computer are only as good as the data and assumptions that go in. In this case, the primary assumption would seem to be that Oxnard's methods are the best method of determining relationships. This seems doubtful, given some of the other unusual results of Oxnard's study (1987). For example, he places Ramapithecus as the ape closest to humans, and *Sivapithecus* as closely related to orang-utans, even though the two are so similar that they are now considered to be the same species of *Sivapithecus*.

Less controversially, Oxnard also claims that, while probably bipedal, australopithecines did not walk identically to modern humans. Creationists sometimes quote this conclusion in a highly misleading manner, saying Oxnard proved that australopithecines did not walk upright, and then adding, as an afterthought (or in Willis' (1987) case, not at all) "at least, not in the human manner".

Creationists are generally reluctant to accept that australopithecines, including Lucy, were bipedal. A statement by Weaver (1985) that "*Australopithecus afarensis* ... demonstrates virtually complete adaptation to upright walking" is dismissed by Willis (1987) as "a preposterous claim". Willis adds: "Many competent anthropologists have carefully examined these and other "Australopithicine" [sic] remains and concluded that Lucy could not walk upright."

Willis' evidence for this consists of a statement by Solly Zuckerman made in 1970; a 1971 statement from Richard Leakey that australopithecines "may have been knuckle-walkers", and a quote from Charles Oxnard about the relationship between humans, australopithecines and the apes. In fact, none of these quotes refer to Lucy. Two of them were made before Lucy, and *A. afarensis*, was even discovered (and the third was made very soon afterwards, before Lucy had been studied).

Even in 1970, Zuckerman's views had long since been largely abandoned. In what is obviously a fabrication, Willis says that Leakey "referred to Lucy as an ape who did not walk upright", three years before Lucy was discovered. Leakey was merely making a suggestion (about robust australopithecines) which he soon retracted, not stating a firm opinion, and he has since stated (1994) that Lucy "undoubtedly was a biped". Oxnard (1975; 1987)

has some unorthodox opinions about the australopithecines, but the Oxnard quote supplied by Willis discusses neither bipedality nor *A. afarensis*. Elsewhere in the same paper that Willis refers to, Oxnard (1975) repeatedly mentions that australopithecines may have been bipedal, and he has since stated (1987) that the australopithecines, including Lucy, were bipedal.

Gish (1985) has a long discussion of the debate about Lucy's locomotion. He quotes extensively from Stern and Susman (1983), who list many apelike features of *A. afarensis* and argue that it spent a significant amount of time in the trees. As Gish admits, none of the scientists he mentions deny that Lucy was bipedal, but he goes on to suggest, with no evidence or support, that *A. afarensis* may have been no more bipedal than living apes, which are well adapted to quadrupedality and only walk on two legs for short distances. By contrast, the feet, knees, legs and pelvises of australopithecines are strongly adapted to bipedality, while the hands and wrists show no adaptations to any form of quadrupedalism (McHenry 1986). Gish's conclusion is strongly rejected by Stern and Susman, and, apparently, everyone else:

> "That bipedality was a more fundamental part of australopithecine behavior than in any other living or extinct nonhuman primate is not in serious dispute."
>
> "... we must emphasize that in no way do we dispute the claim that terrestrial bipedality was a far more significant component of the behavior of *A. afarensis* than in any living nonhuman primate." (Stern, Jr. and Susman 1983)

Gish writes as if showing that *A. afarensis* did not "walk upright in the human manner" is all that is needed to disqualify it as a human ancestor. But there is no reason that bipedality, when it first arose, had to be identical to human bipedality; that final step could have occurred later. As Stern and Susman (1983) state:

> "In our opinion *A. afarensis* is very close to what can be called a "missing link". It possesses a combination of traits entirely appropriate for an animal that had traveled well down the road toward full-time bipedality ..."

Creationist John Morris writes:

> "From the neck down, certain clues suggested to Johanson that Lucy walked a little more erect than today's chimps. This conclusion, based on his interpretation of the partial hip bone and a knee bone, has been hotly contested by many paleoanthropologists." (Morris 1994)

Almost everything in this quote is a distortion (Johanson's and Lucy's names are about the only exceptions). "Certain clues suggested" doesn't mention that the whole find screamed "bipedality" to every qualified scientist who looked at it. "a little more erect", when everyone believes that Lucy was fully erect. "the partial hip bone and a knee bone", when Lucy included almost a complete pelvis and leg (taking mirror imaging into account, and excluding the foot). "has been hotly contested", when no reputable paleoanthropologist denies that Lucy was bipedal. The debates are about whether she was also arboreal, and about how similar the biomechanics of her locomotion was to that of humans. Given that we have most of Lucy's leg and pelvis, one has to wonder what sort of fossil evidence it would take to convince creationists of australopithecine bipedality.

To support the idea that australopithecines are just apes, Parker says:

> "In their critique of the Leakeys, Johanson and White (1980) noted: 'Modern chimpanzees, by this definition [Richard Leakey's] would be classified as *A. africanus*.' Apes after all?" (Morris and Parker 1982)

When the paper by Johanson and White is examined, it is apparent that Parker has taken their quote out of context in a way that almost reverses its meaning. Leakey did not call *A. africanus* a chimp, nor did Johanson and White accuse him of doing so. They criticized Leakey's definition because it was imprecise enough to also include chimps. Of course, such a criticism only makes sense if *A. africanus* is *not* a chimp.

In 1987, creationist Tom Willis accused Donald Johanson of fraud, claiming that the skeleton known as "Lucy" consisted of bones that had been found at two sites about 2.5 km (1.5 miles) apart. Willis had actually confused two separate finds which belong to the same species. (This was in spite of the fact that a best-selling book (Johanson and Edey 1981) has photos of both fossils: AL 129-1 is a right knee, while Lucy has a right femur and a left tibia.) This was a spectacular error which could hardly have been made by anyone who had done the most elementary research, but that didn't stop many other creationists from picking up the claim and repeating it. For a full history of this claim, read the talk.origins knee-joint FAQ file (Lippard 1997).

Creationists rarely address the issue of why australopithecines have a foramen magnum at the bottom of the skull.

Gish (1985) criticizes Dart's reasoning that the Taung baby walked upright, based on the position of its foramen magnum. Gish correctly states that the position of the foramen magnum is closer in juvenile apes and humans than it is in adults (in apes, it moves backwards during growth), and concludes that Dart was unjustified in analyzing this feature on a juvenile skull. This is the same criticism that Dart originally faced from scientists, but Gish fails to mention that later evidence proved Dart's analysis correct and silenced his critics.

Creationists also rarely mention australopithecine teeth. Gish says that "[Dart] pointed out the many ape-like features of the skull, but believed that some features of the skull, and particularly of the teeth, were man-like". (Note the misleading implication that the apelike features really exist, while the humanlike ones are a figment of Dart's imagination.) Gish disputes this, pointing out that the molar teeth of *africanus* are extremely large. What Gish does not tell readers is that this is one of the few differences between them and human teeth. When the teeth of the Taung child could be properly examined, Dart's claim was strongly confirmed, and is now generally accepted:

> "In fact, though the molars were larger than is now normal, most of the teeth [of the Taung child] could have belonged to a child of today." (Campbell 1988)

Knee-joint FAQ file, by Jim Lippard

Offsite: Richard LaHaye and Lucy, by Pierre Stromberg

Offsite: Lucy, from the Institute of Human Origins

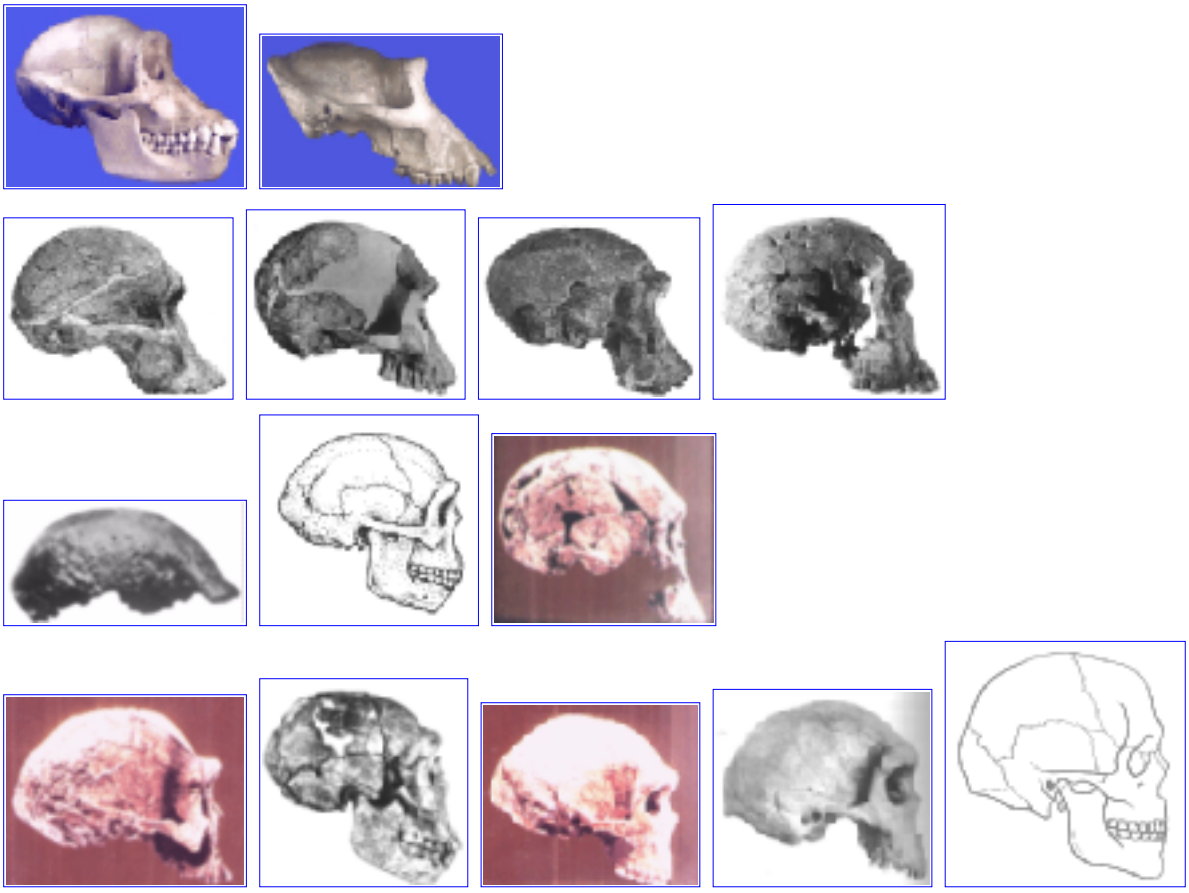
Offsite: The Lucy Test, by Matthew Priestley

Offsite: Lucy Fails Test as Missing Link, by Lane Anderson (creationist article)

Offsite: Journey to Ethiopia, by Jeffrey Marr (creationist article)

Offsite: Early Man: Lucy (creationist article)

Comparison of all skulls



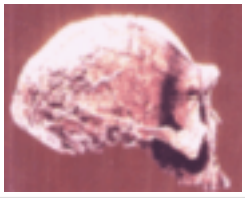
- Chimpanzee, Gorilla
- Sts 5, Stw 53, OH 24, ER 1813
- Java Man, Peking Man, ER 1470
- ER 3733, WT 15000, Petralona, Rhodesian Man, modern human

The skulls on the top row are of modern apes. The skulls on the 2nd row are fossils that all creationists consider apes, while the ones on the bottom row are all considered to be humans. The skulls in the 3rd row are ones on which creationists disagree as to whether they are apes or humans. (For ease of comparison, some skulls are reflected so that they all face in the same direction.)

The following table summarizes the diversity of creationist opinions about some of the more prominent items in the human fossil record. (If your browser doesn't support tables, click here for a text version.)

Creationist Classifications of Hominid Fossils

Specimen		Gish (1985)	Mehlert (1996)	Bowden (1981) Menton (1988) Taylor (1992) Gish (1979)	Baker (1976) Taylor and Van Bebber (1995)	Taylor (1996) Lubenow (1992)
	ER 1813 (510 cc)	Ape	Ape	Ape	Ape	Ape

	Java (940 cc)	Ape	Human	Ape	Ape	Human
	Peking (915-1225 cc)	Ape	Human	Ape	Human	Human
	ER 1470 (750 cc)	Ape	Ape	Human	Human	Human
	ER 3733 (850 cc)	Human	Human	Human	Human	Human
	WT 15000 (880 cc)	Human	Human	Human	Human	Human

As this table shows, although creationists are adamant that none of these are transitional and all are either apes or humans, *they are not able to tell which are which*. In fact, there are a number of creationists who have changed their opinion on some fossils. They do not even appear to be converging towards a consistent opinion. Gish and Taylor both used to consider Peking Man an ape and 1470 a human, but now Gish says they are both apes, and Taylor says they were both humans. Interestingly, the most widely differing views are held by the two most prominent creationist researchers on human origins, Gish and Lubenow. Bowden, who has also written a book on human evolution, agrees with neither of them, and Mehlert, who has written a number of long articles on human evolution in creationist journals, has yet another opinion.

It could be pointed out that evolutionists also disagree on how fossils should be classified, which species they belong to, etc. True enough. But according to evolutionary thinking, these fossils come from a number of closely related species intermediate between apes and humans. If this is so, we would expect them to be hard to classify, and they are.

Creationists, on the other hand, assert that apes and humans are separated by a wide gap. If this is true, deciding on which side of that gap individual fossils lie should be trivially easy. Clearly, that is not the case.

ER 1813 (*H. habilis*?, 510 cc) is almost totally ignored by creationists, but it is safe to say that they would all classify it as an ape. Few mention ER 3733 (*H. erectus*, 850 cc) either, but those who do seem to consider it human (although it's hard to be sure in Bowden's case). Because it is was found fairly recently, WT 15000 is not mentioned much either, but it is safe to say, in view of its essentially human skeleton, that no creationist would consider it an ape.

It would be fascinating to know what creationists think about fossils such as OH 12 (*H. erectus*, 750 cc), Sangiran 2 (*H. erectus*, 815 cc), OH 7 (*H. habilis*, 680 cc), but unfortunately few creationists even mention these fossils, let alone discuss them in any depth.

References

Baker S.: Bone of contention: is evolution true?, Evangelical Press, 1976

Bowden M.: Ape-men: fact or fallacy? Bromley,Kent:Sovereign, 1981. Ed. 2

Gish D.T.: Evolution: the fossils say no, San Diego:Creation-Life Publishers, 1979. Ed. 3 (this is the third edition of a book first published in 1972 and is somewhat out of date)

Gish D.T.: Evolution: the challenge of the fossil record, El Cajon, CA:Creation-Life Publishers, 1985.

Lubenow M.L.: Bones of contention: a creationist assessment of human fossils, Grand Rapids,MI:Baker Books, 1992.

Mehlert A.W. : *Australopithecus* and *Homo habilis* - pre-human ancestors? Creation Ex Nihilo Technical Journal, 10.2, 219-40, 1996.

Menton D.N.: The scientific evidence for the origin of man, 1988. (a creationist essay)

Taylor P.S.: The illustrated origins answer book, Mesa,Arizona:Eden Productions, 1992. Ed. 4

Taylor P.S.:Who's who and what's what in the world of "missing" links?, 1996

Taylor P.S. and Van Bebber M.: Who's who and what's what in the world of "missing" links?, 1995 (an earlier version of Taylor 1996)

Creationist Arguments: *Homo habilis*

Despite its importance, *Homo habilis* is virtually ignored by creationists. The one exception is ER 1470, which is too well-known to be totally ignored. Creationists disagree on whether 1470 is an ape or a human. The other *habilis* fossils are never analyzed, but the few creationists who do mention them are in agreement that they are all apes.

The skull ER 1470 was discovered in 1972, and publicized as both amazingly humanlike, and extremely old, at nearly 3 million years. Creationists eagerly seized on the statement of Richard Leakey, its discoverer, that 1470 "wipes out everything we have been taught about human evolution [this proved to be wrong], and I have nothing to offer in its place". Creationists sometimes give the impression that it is a modern human skull. But despite some modern traits, it has a number of australopithecine features, and a brain size of about 750 cc. Gish (1979) points out its small size, but states that its age and sex are unknown, presumably seeking to imply that it might belong to a child. That is not probable, as can be seen from comparative photos (Weaver 1985). 1470's face is very robust, and as large as that of a modern Cro-Magnon skull, despite a much smaller brain size, and the cranium has a markedly different shape. There is also other evidence that it was an adult.

Curiously, as a debating tactic to discredit other hominid fossils, creationists often accept 1470 as human, even though many of them reject larger-brained *erectus* specimens as apes. But if 1470 is human, one could then make a strong case that the very similar but smaller skull ER 1813 is also human. Creationists, however, are unlikely to find the idea of a human with a brain size of 510 cc very appealing.

Gish in 1979 tentatively accepted 1470 as fully human. By 1985, he seemed to have reversed that opinion, and was suggesting that it should be placed in the genus *Australopithecus* (as have some scientists). His reasoning for this is that another *habilis* fossil (OH 8, a set of foot bones) had been claimed by Oxnard and Lisowski to be not as humanlike as previously thought. This is used to justify placing all *habilis* fossils, including 1470, into the australopithecines. The OH 8 foot, of course, did not belong to 1470, and may not even have belonged to a member of the same species, so it is irrelevant to determining 1470's status. Gish implies that his earlier evaluation of 1470 was based on preliminary information, but the photos and descriptions on which Gish based his earlier opinion were published as early as 1973. Gish gives no new information about 1470 that would justify reclassifying it from a human to an ape.

If 1470 was an ape, it would be a truly extraordinary one. The brain is far larger than that of any ape, with the possible exception of extremely large male gorillas. The braincase is far more rounded and gracile than that of any ape, and the brain has a human rather than an apelike pattern (Tobias 1987).

Cronin et al.(1981) list nine features of 1470 which are either shared with *A. africanus*, or intermediate between *africanus* and other H. *habilis* specimens. Gish lists some of these in support of his contention that 1470 is australopithecine, but, in a fine example of selective quotation, failed to include another section from the same paragraph listing other features of 1470 that are generally associated with the genus *Homo*. Similarly, Gish (1995) quotes a passage from Bromage (1992) stating that 1470's face would have jutted out considerably, like that of an ape, but ignores the next paragraph, which states "... ER 1470 is *Homo* in many respects and it has a phenomenally large brain for its time".

Lubenow (1992) does the opposite. He quotes a report in Science News (Nov 18, 1972) which says that the braincase of 1470 is remarkably reminiscent of modern man, but ignores the statement, a few sentences prior, that "The skull is different from *Homo sapiens*, says Leakey ...".

Lubenow concludes that 1470 is fully human. So two of the foremost creationist experts on paleoanthropology are both certain that 1470 is not intermediate between human and ape, yet one of them thinks it an ape, and the other thinks it is a human! There could be no more convincing demonstration of its transitional status.

Although 1470 is usually placed in the genus *Homo*, it is definitely not a modern human. There is ample evidence of this:

> "The endocranial capacity and the morphology of the calvaria [braincase] are characters that suggest inclusion within the genus *Homo*, but the maxilla [upper jaw] and facial region are unlike those of any known form of hominid." (Leakey 1973)

> "From the size of the palate and the expansion of the area allotted to molar roots, it would appear that ER 1470 retained a fully *Australopithecus*-sized face and dentition." (Brace et al. 1979)
>
> "KNM-ER 1470, like other early *Homo* specimens, shows many morphological characteristics in common with gracile australopithecines that are not shared with later specimens of the genus *Homo*" (Cronin et al. 1981)
>
> "There is no evidence that this cranium particularly resembles *H. sapiens* or *H. erectus* according to either phenetic or cladistic evidence. Phenetically, KNM-ER 1470 is closest to the remains from Olduvai [considered apes by creationists] referred to *H. habilis*. (Wood 1991)
>
> "Ignoring cranial capacity, the overall shape of the specimen and that huge face grafted onto the braincase were undeniably australopithecine." (Walker and Shipman 1996)

In fact, the face and palate of 1470 are so large that until the braincase was assembled, Richard Leakey thought, judging from the facial bones, that 1470 was a robust australopithecine (Walker and Shipman 1996).

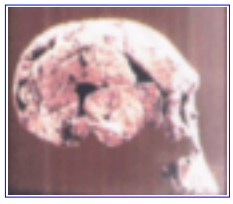
In view of these differences, on what evidence does Lubenow claim that there is no compelling morphological reason not to assign ER 1470 to *H. sapiens*? None, apparently. It appears to be his own opinion, and is unsupported by any qualified scientist.

Shortly after 1470 was discovered, anatomist A. Cave said in an interview that it was "As far as I could see, typically human" (Hillaby 1972). Creationists interpret this to mean that it was the skull of a modern human; in fact, Bowden (1981) thinks it "probably the most convincing evidence" of this. More likely is that Cave was merely saying that the skull belonged to, and had features typical of, the genus *Homo*. However without further context, which Hillaby does not provide, it is impossible to determine what Cave meant. Cave's assessment occurred soon after 1470 was unveiled in London, and was almost certainly based on only a short look at the fossil, rather than detailed study.

Another fossil which Lubenow considers human is ER 1590, consisting of cranial fragments and teeth of a child of about 6 years. It is not complete enough for the brain size to be directly measured, but it seems to be very close in size to 1470. However this child had teeth which were larger than those of *Homo erectus*, which are in turn larger than those of *Homo sapiens*. In addition, the sequence of tooth development has little resemblance to that of *Homo sapiens* (Wood 1991).

Although Lubenow considers 1470 to be human, he would place the smaller *habilis* fossils such as OH 24, ER 1805 and ER 1813 in the australopithecines. The largest of these has a brain size of about 600 cc (1470 is 750 cc), hardly enough to constitute "the significant gap" that Lubenow says separates australopithecines from humans. And Lubenow does not mention that there are two other *habilis* skulls (OH 13 (650 cc) and OH 7 (680 cc), neither of which are adult), that fall squarely into the middle of this gap.

To support his claim that 1470 is human and other *habilis* fossils are apes, Lubenow quotes from a paper by Dean Falk (1983), which states that the endocast of 1470 has a human pattern, while that of 1805 is apelike (these were the only fossils discussed by Falk). However Tobias (1987) shows that other habilis fossils such as OH 7, OH 13, OH 16 and OH 24 (which creationists consider apes) all share many advanced features with ER 1470.



ER 1813 (510 cc) also has many of the same features that creationists use to justify calling 1470 a modern human. It is lightly built, with a rounded skull and no sagittal crest, modest eyebrow ridges, and a small amount of nasal prominence (Day 1986). This is combined with a jaw and teeth that are similar to but larger than those of modern humans. Another transitional fossil! Because its brain was far smaller than any human, creationists have no choice but to call this an ape, despite the fact that 1470 looks more similar to 1813 than it does to a modern human skull.

In fact, despite its larger brain size, Cronin et al.(1981) consider 1470 to be *more* primitive, with more australopithecine features, than 1813. The teeth of 1470 (as inferred from the sockets) were australopithecine-sized, while 1813 had smaller, *Homo erectus*-sized teeth (Klein 1989). Other scientists (reviewed in Wood (1992)) consider 1470 to belong to the same species as either OH 7 or 1813. OH 62 also closely resembles 1470 (Johanson et al. 1987). Sorting out the exact relationships of these fossils is very difficult, but it is

clear that all of them are similar, with a mixture of *Homo* and *Australopithecus* features. There is no "significant gap" separating 1470 from the others.

See also the *Homo habilis* section of the email debate between myself and Richard Milton.

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Creationist Arguments: *Homo erectus*

The only *Homo erectus* fossils mentioned by many creationists (Huse 1983; Morris and Parker 1982; Taylor 1992) are the Java Man and Peking Man fossils (discussed in the following sections). Most creationists consider both apes, although Lubenow (1992) considers both human. There are even a few creationists who consider Java Man an ape and Peking Man a human, despite the fact that many books stress their very close similarity.

A few authors do mention other *erectus* fossils in passing. Morris suggests, although it is not clear which specimens he is referring to, that they are degenerate humans:

> "It may well be that *Homo erectus* was a true man, but somewhat degenerate in size and culture, possibly because of inbreeding, poor diet and a hostile environment" (Morris 1974).

Gish (1985) suggests that many *erectus* fossils would have been attributed to Neandertal Man were it not for their supposed age, and hence probably also considers the *erectus* morphology, like that of the Neandertals, to be caused by disease.

There is no explanation of why these adverse conditions would cause *H. erectus* to be so physically powerful, and in fact many *erectus* may have been of average human size (see the entry on the Turkana Boy fossil). Nor is it explained why all human skulls over 500,000 years old are *erectus*, and why, given the number of modern people who face a poor diet and a hostile environment, no *erectus* specimens are found nowadays.

Bowden (1981) briefly discusses ER 3733, but so vaguely that it is difficult to determine whether he thinks it is an ape or a human! This fossil, despite massive brow ridges and other primitive features, is so complete and looks so human that it seems unlikely anyone would call it an ape (and no other creationists have done so). It seems equally unlikely that Bowden would call it a human, since he acknowledges its similarity to the Peking Man skulls which he claims are apes, and all of which are larger than 3733. Bowden escapes this dilemma by instead casting aspersions on the accuracy of ER 3733's reconstruction (almost all other creationists solve it by not mentioning ER 3733).

Bowden's even briefer mention of OH 9 is just as cryptic. He notes its similarities to both Pithecanthropus [ape] and a Neandertal [human] skull. In one sentence he refers to it as "surprisingly advanced", but the next paragraph starts: "Reviewing all these fossil apes, ...". Bowden's description of OH 9 makes it sound so intermediate in nature between apes and humans that, once again, it is difficult to decide what he thinks it is.

One *Homo erectus* specimen, the Turkana Boy, is recognized by Gish as human. Unavoidably, since it is an *erectus* skull attached to a body that is almost completely modern. Gish (1985), writing soon after it was discovered, cautiously suggests that except for the brain size, all major aspects of the skeleton are within the limits of *Homo sapiens*, and that were it not for the estimated age of 1.6 million years it would be assigned to that species. In a later assessment (1995) Gish says that the size and shape of the braincase and a few characteristics of the body were the only differences from a modern human. Menton (1988) similarly states that WT 15000 was classified as *H. erectus* only because of its age.

That is incorrect; the Turkana Boy has a typical *erectus* skull, differing from modern humans in many aspects other than brain size. It is more similar to 1470 (*H. habilis*), or to other *erectus* specimens such as the Peking Man braincases, than it is to modern humans. It is strikingly similar to the Peking Man reconstruction made by Weidenreich, which even Gish agrees looks to be "intermediate between the Anthropoid Apes and Man".

The skeletal differences are less obvious, but in combination they show a skeleton with small but significant differences from modern humans. The length of the neck and the neck-shaft angle in the femur are respectively "well over 3" and 5 standard deviations from the modern human norm (Brown et al. 1985). The boy was extraordinarily strong, and his spinal cord had less than half the cross-sectional area of ours (Walker and Shipman 1996). According to Richard Leakey, "practically every piece of bone shows minute but unquestionable differences from modern man" (Angela 1993). Gish stresses the skeletal similarities but ignores these differences.

Menton (1988) states that the Turkana Boy was like a modern human "except for certain details of the skull", and then adds that:

> "He had a low forehead and pronounced brow ridges not unlike some races of modern man.

> Richard Leaky [sic] said that this boy would go unnoticed in a crowd today." (Menton 1988)

Menton has taken this quote out of context, omitting some text that significantly changes its meaning:

> "Suitably clothed and **with a cap to obscure his low forehead and beetle brow**, he would **probably** go unnoticed in a crowd today." (Leakey and Walker 1985)

Lubenow (1992) has argued that *Homo erectus* is similar enough to *H. sapiens* that it should be merged into it. For example, he quotes Wolpoff et al.(1984):

> "In our view, there are two alternatives. We should either admit that the *Homo erectus/Homo sapiens* boundary is arbitrary and use nonmorphological (i.e. temporal) criteria for determining it, or *Homo erectus* should be sunk [into *H. sapiens*]."

Wolpoff and his colleagues support what is known as the multiregional theory, which holds that populations of *H. erectus* throughout the world evolved together towards *H. sapiens* (as opposed to the "out of Africa" theory, which holds that one population of *H. erectus* gave rise to all modern humans).

Wolpoff et al. are *not* saying that *H. erectus* cannot be distinguished from modern humans; in fact they point out that it "on the average shows clear morphological distinctions from *Homo sapiens*". Nor do they dispute that *H. sapiens* evolved from *H. erectus*. They propose sinking *H. erectus* into *H. sapiens* because there are so many intermediate fossils that it is difficult to define a boundary between them, and because there are theoretical reasons for calling them the same species (no matter how much anatomical difference there is) if, as the multiregionalists believe, *H. sapiens* did not branch off from a subset of the *H. erectus* population.

Most scientists disagree, believing that the differences are clearly enough to merit a species distinction. A growing number would go further, and argue that there is room for another species between them, *Homo heidelbergensis*, which would contain many of the fossils now called "archaic" *Homo sapiens* (Tattersall 1995). It is also far from certain that the multiregional theory is correct, in which case even the theoretical reasons for sinking *H. erectus* would disappear.

Scientists who propose sinking *H. erectus* therefore provide no comfort for creationists, since their reasons totally contradict creationists who would claim that the *H. erectus* morphology is caused by diseases of, or racial variation in, *H. sapiens*.

Creationist Arguments: Java Man

Many creationists have claimed that Java Man, discovered by Eugene Dubois in 1893, was "bad science". Gish (1985) says that Dubois found two human skulls at nearby Wadjak at the same level and had kept them secret; that Dubois later decided Java Man was a giant gibbon; and that the bones do not come from the same individual. Most people would find Gish's meaning of "nearby" surprising: the Wadjak skulls were found 65 miles of mountainous countryside away from Java Man. Similarly for "at the same level": the Wadjak skulls were found in cave deposits in the mountains, while Java Man was found in river deposits in a flood plain (Fezer 1993). Nor is it true, as is often claimed, that Dubois kept the existence of the Wadjak skulls secret because knowledge of them would have discredited Java Man. Dubois briefly reported the Wadjak skulls in three separate publications in 1890 and 1892. Despite being corrected on this in a debate in 1982 and in print (Brace 1986), Gish has continued to make this claim, even stating, despite not having apparently read Dubois' reports, that they did not mention the Wadjak skulls (Fezer 1993).

Lubenow does acknowledge the existence of Dubois' papers, but argues that since they were bureaucratic reports not intended for the public or the scientific community, Dubois was still guilty of concealing the existence of the Wadjak skulls. This is also incorrect; the journals in which Dubois published, although obscure, were distributed in Europe and America, and are part of the scientific literature. They are available in major libraries and have often been referred to by later researchers (Brace, 1996:pers.comm.).

Based on his own theories about how brains had evolved and wishful thinking, Dubois did claim that Java Man was "a gigantic genus allied to the gibbons", but this was not, as creationists imply, a retraction of his earlier claims that it was an intermediate between apes and humans. Dubois also pointed out that it was bipedal and that its brain size was "very much too large for an anthropoid ape", and he never stopped believing that he had found an ancestor of modern man (Theunissen 1989; Gould 1993; Lubenow 1992).

Creationists are right about one thing. Most modern scientists agree that the femur is more recent than the skullcap, belonging to a modern human. Some of the teeth found nearby are now thought to be from an orang-utan, rather than *Homo erectus*.

It is instructive to listen to Gish (1993) expounding on the apelike qualities of the skullcap:

> "Now we see that the skullcap is very apelike; notice that it has no forehead, it's very flat, very typical of the ape. Notice the massive eyebrow ridges, *very* typical of the ape".

Despite this, the skullcap definitely does not belong to any ape, and especially not to a gibbon. It is far too large (940 cc, compared to 97 cc for a gibbon), and it is similar to many other *Homo erectus* fossils that have been found. One of these is Sangiran 17, also found on Java. This skull, which is never mentioned by creationists, is an almost complete cranium and is clearly human, albeit primitive. Others are the Turkana Boy and ER 3733 fossils, both of which creationists recognize as human.

If one is trying to pigeonhole Java Man as either an ape or a human, calling it a human is easily the best choice, but Lubenow (1992) seems to be the only creationist who has done so. However he attempts to disqualify Java Man as a primitive human by using faunal evidence to show that it is the same age as the Wadjak skulls. Lubenow gives the following quote from Hooijer (1951):

> "*Tapirus indicus*, supposedly extinct in Java since the Middle Pleistocene, proved to be represented in the Dubois collection from the Wadjak site, central Java, which is late - if not post - Pleistocene in age."

Lubenow is saying that since this species of tapir was found in both the Trinil [the site where Java Man was found] and Wadjak faunas, these fossils may be of the same age. This conclusion is reinforced by three other quotes from Hooijer, all of which describe difficulties in using faunal methods to date Javan fossils. Lubenow's argument fails for a number of reasons.

Even if faunal methods were completely invalid, it would not constitute evidence that Wadjak Man and Java Man were the same age. The most that could be claimed was that the ages of both were unknown. However Hooijer never said that the faunal methods were useless, or that the Wadjak and Trinil faunas were the same.

By far the simplest resolution of the tapir discrepancy is, as Hooijer stated, that *Tapirus indicus* survived longer

than previously thought on Java (Lubenow does admit this possibility). This is consistent with the rest of the evidence. The Wadjak fauna is modern, and hence Wadjak Man is considered to be less than 50,000 years old, and more probably about 10,000 years old. The Trinil fauna contains many more extinct species, and is hence older.

Basically, Lubenow argues that Wadjak Man and Java Man are the same age because a single species of tapir is in both faunas, ignoring that there are many other species not shared between the faunas, and that the extinct species are exclusively in the Trinil fauna.

Lubenow claims that Dubois concealed the Wadjak fossils because the discrepancy of the tapir would have contradicted his claim that Java Man was far older than Wadjak. This seems implausible because Dubois was one of the earliest collectors in Java, and detailed information on the Javan faunas was not compiled until decades later (Hooijer 1951).

Incidentally, the tapir was probably not singled out for mention by Hooijer because it is an anomaly, as Lubenow seems to suspect. It was probably of interest because this species of tapir is still living in South East Asia, and is not, as Lubenow states, extinct. (Hooijer only stated that it was extinct *in Java*, not elsewhere.)

Parker (Morris and Parker 1982) expresses puzzlement that Johanson (1981) considers Java Man to be a valid fossil. It is of course a valid fossil because the skullcap had to belong to something, but Parker merely dismisses it as "bad science". (He seems to be of the opinion that it was an ape, but does not say so explicitly.)

Was Java Man a gibbon?

Compare Java Man with Turkana Boy

Did Dubois hide Wadjak Man?

Duane Gish and Wadjak Man

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http://www.talkorigins.org/faqs/homs/a_java.html, 04/28/97

Was Java Man a gibbon?

In a word: No. Gibbon skulls have an average cranial capacity of about 100 cc. The Java Man skullcap was about 940 cc, considerably larger than even the largest gorilla skulls, which are over 700 cc. Such rough similarity of shape as exists between gibbons and Java Man is common to many apes and hominids. The Java Man skull closely resembles other *Homo erectus* skulls, and there is no reason not to place it in that species (or possibly in the closely related *Homo ergaster*).

The following photo is a comparison of a gibbon skull, on the left, with a cast of the Java Man skullcap (made with the help of the staff at the American Museum of Natural History).

The next question is:

Did Eugene Dubois claim that Java Man was a gibbon?

Most creationists (and some evolutionists) state that Eugene Dubois decided in the 1930's that the Java Man skullcap was merely that of a large gibbon. Not usually stated, but implied, is that he had abandoned his claims for it as a human ancestor and decided that it had nothing to do with human evolution. Here is what Dubois actually said, in papers published in 1935 and 1937:

> "*Pithecanthropus* [Java Man] was not a man, but a gigantic genus allied to the gibbons, however superior to the gibbons on account of its exceedingly large brain volume and distinguished at the same time by its faculty of assuming an erect attitude and gait[1]. It had the double cephalization [ratio of brain size to body size] of the anthropoid apes in general and half that of man."
>
> "It was the surprising volume of the brain - which is very much too large for an anthropoid ape, and which is small compared with the average, though not smaller than the smallest human brain - that led to the now almost general view that the "Ape Man" of Trinil, Java was really a primitive Man. Morphologically, however, the calvaria [skullcap] closely resembles that of anthropoid apes, especially the gibbon."
>
> "... I still believe, now more firmly than ever, that the *Pithecanthropus* of Trinil is the real 'missing link'."
>
> "E. Dubois: On the gibbon-like appearance of *Pithecanthropus erectus*. While possessing many gibbon-like characteristics, *P. erectus* fills the previously vacant place between the Anthropomorphae and man as regards cephalic coefficient. (Amsterdam Royal Acad., Proc 38, No 6, June 1935)". (Reported in Nature, 136:234, Aug 10 1935)

(The first two paragraphs are quoted by Trinkaus and Shipman, the first and third are quoted by Gould)

Trinkaus and Shipman's comment on this is:

> "That Dubois ever claimed his fossils to be a giant gibbon is denied by some authorities, but his words here are unambiguous."

They must be somewhat ambiguous, because Gould's opinion is diametrically opposed:

> "In other words, Dubois never said that *Pithecanthropus* was a gibbon (and therefore the lumbering, almost comical dead end of the legend); rather, he reconstructed Java Man with the proportions of a gibbon in order to inflate the body weight and transform his beloved creature into a direct human ancestor - its highest possible status - under his curious theory of evolution.[2]"

The phrases "closely resembles ... the gibbon" and "a gigantic genus allied to the gibbons", are vague. Dubois *seems* to have thought that Java Man was most similar to, and/or most closely related to, gibbons. (This assessment is rejected by all modern scientists.) Whether that is the same thing as calling it a giant gibbon is debatable, but I side with Gould here; saying that Java Man was allied to the gibbons does not seem to be the same thing as saying that it *was* a gibbon.

What *is* indisputable is that Dubois was not saying that *Pithecanthropus* had nothing to do with human evolution, as creationists usually imply. Dubois was always firmly convinced that Java Man was a human ancestor.

Nor did Dubois decide that the skullcap and human femur found about 45 ft away were unrelated; he always insisted that they belonged to the same creature. He was probably wrong in this, but the error is not of great significance: Java Man was undoubtedly bipedal. This is shown by the *Homo erectus* skeleton WT 15000, discovered in Kenya in 1984. Its skullcap is very similar to that of Java Man, but its femur and the rest of its skeleton is, with only minor differences, identical to that of modern humans.

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1. As it turned out, Dubois was correct in saying that *Pithecanthropus* was bipedal, even though the femur that he used as evidence of bipedality is no longer thought to belong to the same creature as the skull cap.

2. Dubois' theory was that brain evolution advanced in leaps, in which the brain effectively doubled in complexity from a previous stage. In this scheme, humans had 4 times the "cephalization" of apes, and *Pithecanthropus*, with its "double cephalization", nicely filled the gap between them.

References

Gould S.J. (1993): Men of the thirty-third division. In Eight little piggies. (pp. 124-37). New York: W.W.Norton. (an essay about Eugene Dubois' theories on Java Man)

Theunissen B. (1989): Eugene Dubois and the ape-man from Java. Dordrecht,The Netherlands: Kluwer Academic Publishers.

Trinkaus E. and Shipman P. (1992): The neandertals: changing the image of mankind. New York: Alfred E. Knopf.

Creationist arguments about Java Man

Java Man and Turkana Boy

The first photo is of the Java Man skullcap. Most creationists consider this an ape, including Gish (1993), who says:

> "Now we can see the skullcap is very apelike. Notice that it has no forehead, it's very flat, very typical of the ape. Notice the massive eyebrow ridges, *very* typical of the ape" ...
>
> "I would tend, quite strongly, to agree with Eugene Dubois and with Marcellin Boule that these creatures [Java Man and Peking Man] were giant primates of some kind."
>
> "... it is very likely that Dubois' final assessment of his Pithecanthropus erectus may be the correct one - a very large primate of some kind within the generalized group called apes, possessing no genetic relationship to man whatsoever." (Gish 1995)

The second photo is of the skull of the *Homo erectus* specimen WT 15000 (the Turkana Boy). Gish (1985) accepts this as human, and suggests that it was placed in *Homo erectus*, rather than *H. sapiens*, only because of its age of 1.6 million years. In a later book, Gish says:

> "The size and shape of the braincase and a few other characteristics of the postcranial skeleton were the only exceptions when the skeleton of this young boy was compared to those for modern humans."
>
> "...the features of the Nariokotome juvenile were remarkably human with few exceptions." (Gish 1995)

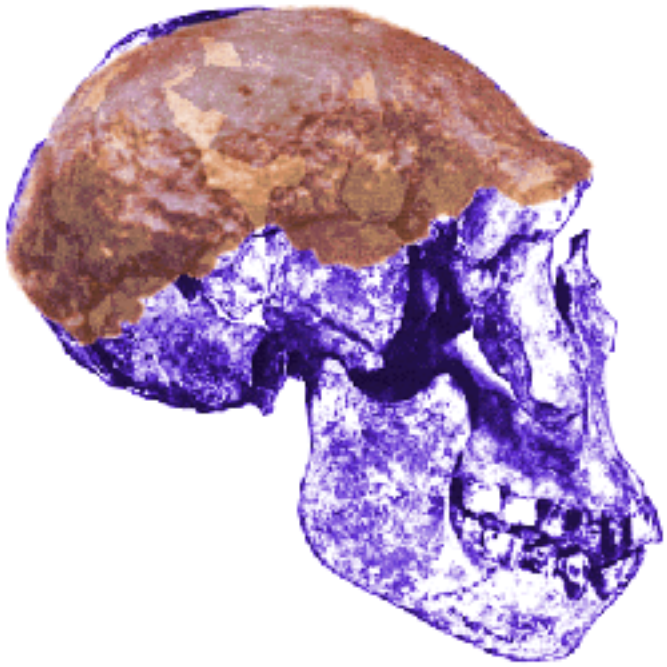
The third picture is a drawing of a modern human skull.

Note that the skull of the Turkana Boy is quite different from a modern skull. To illustrate this, draw a line from the eyebrow ridge to the corner made by the lower jaw and the bottom of the skull. This divides the Turkana Boy's

skull into two almost equal-sized parts. With the human skull, the upper part is much larger.

Note also that the Turkana Boy looks very similar to the Java Man skullcap. In fact, Gish's description of Java Man given above could equally well apply to the Turkana Boy. Java Man also has a brain size of 940 cc (far larger than any ape), compared to the estimated adult size of 910 cc for the Turkana Boy.

Here is another picture, showing both fossils overlaid:



In spite of this remarkable similarity, Gish continues to claim that the Java Man is an ape, while the Turkana Boy is a modern human. In his words, they are "very apelike" and "remarkably human" respectively. If a "human" that looks almost identical to an "ape" isn't a transitional fossil, what would be?

References

Gish D.T.: The "missing links" are still missing (part 2). Science, Scripture and Salvation (ICR radio show) Sep 18:1993.

Gish D.T.: Evolution: the challenge of the fossil record, El Cajon, CA:Creation-Life Publishers, 1985.

Gish D.T. (1995). Evolution: the fossils still say no! El Cajon, CA: Institute for Creation Research. (an updated version of Gish 1985)

Creationist arguments about Java Man

Creationist arguments about *Homo erectus*

Thanks to Brett Vickers for creating the composite picture above.

Did Dubois hide Wadjak Man?

Gish (1985) and many other creationists have claimed that Eugene Dubois, discoverer of Java Man, hid the existence of two human skulls, called the Wadjak skulls, that had also been discovered on Java. This claim is demonstrably false; there are three separate publications by Dubois which mention the Wadjak skulls (Fezer, 1993).

(Wadjak 1 (shown) was discovered in 1888 by mining engineer B.D. van Rietschoten. Wadjak 2 was more fragmentary and was discovered in 1890 by Dubois.)

Lubenow admits the existence of these publications, but argues that they were governmental reports not intended for public or scientific scrutiny. As such, they do not count as part of the scientific literature, and Dubois is still guilty of having, in effect, concealed the existence of the Wadjak skulls.

Following is some email correspondence from prominent paleoanthropologist C. Loring Brace, responding to this claim.

Date: Mon, 22 Jan 1996 17:33:37 -0500 (EST)
From: "C. Loring Brace" <clbrace@umich.edu>
To: Jim.Foley@symbios.com
Subject: Re: Sinanthropus/Pithecanthropus

Dear Colleague,

[two paragraphs deleted]

As for Wadjak, the first skull was given to Dubois by the mineworks owner van Rietschoten. Dubois described it in a letter to Dr. Ph. Sluiter (director of the library and Museum in what was then "Batavia") which was published in the Naturkundig Tijdschrift van Nederlandsch-Indie [1] vol. 49 (1890) pp. 209-211. This was read at the Directors' Meeting in March 14, 1889. The journal was not a major phenomenon like Nature or even the publication of the American Museum of Natural History, but it was widely distributed and available in Europe and America. Our library here at Michigan has it, and I first read the University of California's copy years ago (or perhaps even the one in Peabody at Harvard).

That was what sent Dubois to Java from Sumatra where he had been for the previous few years, and, after getting there, he contributed regular quarterly reports to the Verslag van het Mijnwezen which Hrdlicka translates as the Government Mining Bulletin. I do not know how this gets subsumed under Education, Religion and Industry [2], but it was a technical report that focused on matters of mineral resources although it also included natural history in general and paleontology in particular. In his report, titled in each issue "Palaeontologische onderzoekingen op Java," he mentioned the van Rietschoten find in the 2nd kwartaal 1890 on p. 19 noting that it was of "another race than the Malay". In his report for the 3rd kwartaal, 1890, he described his find of Wadjak II on page 15, noting that it, like Wadjak I, indicated the presence "in Java in earlier times of a human race that can be compared with modern Australians (or Papuans)" (p. 15).

Then he repeats this in the Jaarboek van het Mijnwezen in Nederlandschen Oost-Indie 20(2):60-61 in 1892. All of these reports, although not major publications, should indeed be counted as a legitimate part of the scientific literature. They are available in major libraries all over the world, and have been referred to repeatedly by the people who have continued to make further analyses of the Wadjak material. Keith [3] was not very good at citing

the primary literature and could not use German (let alone Dutch) as a scholarly language. I have had to read Dubois' accounts by struggling to deal with the spelling/sound shifts that transform it into German, but, when I have doubted my translations, I have checked them with a colleague who is fluent in Dutch. Dubois clearly felt that his "Pithecanthropus" material was of major significance, and he documented what he considered to be its Pliocene age in fully creditable fashion. By the faunal content, he clearly showed that Wadjak was late Pleistocene which, he thought, made it relatively unimportant which is why he did not devote much attention to it until after World War I. Wadjak and 'Pithecanthropus' had nothing do do with each other in his mind or in the views of any paleoanthropologist, and the attempt to see something sinister in his treatment of Wadjak is based on equal parts ignorance and malice.

I hope this can be of some use to you.

C. L. Brace

Date: Thu, 25 Jan 1996 16:01:21 -0500 (EST)
From: "C. Loring Brace" <clbrace@umich.edu>
To: Jim.Foley@symbios.com

Just one final addition:

All those references to Dubois' papers on Wadjak I sent you were consulted by Hrdlicka in his Skeletal Remains of Early Man, Smithsonian Miscellaneous Collection No. 83, 1930. It was Hrdlicka's references that sent me back to find the originals which were not hard to locate. This is the classic way that scientific documentation proceeds, and, if nothing else, should illustrate in unassailable published fashion that Dubois' work was part of the ongoing and publically available scientific literature. Hrdlicka's work, of course, is one of the classics of the field.

With kindest regards,

C. L. Brace

Footnotes are by Jim Foley, not C. Loring Brace.

1. Best translated as "Journal of Natural History of the Dutch East Indies" (now Indonesia). Judging from its name, it is not, as Lubenow stated, a bureaucratic report to a government department.

2. Lubenow had claimed that "This publishing was nothing more than Dubois's quarterly and annual reports to the Director of Education, Religion and Industry of the Dutch East Indies...".

3. Sir Arthur Keith, a very prominent scientist in the first half of this century. Keith may have been the inspiration for the creationist claim that Dubois hid Wadjak Man because it would have discredited Java Man as a human ancestor:

> "... we cannot question his honesty; the Wadjak fossil bones were discovered under the circumstances told by him. There can be no doubt that if, on his return in 1894, he had placed before the anthropologists of the time the ape-like skull from Trinil side by side with the great-brained skulls of Wadjak, both fossilised, both from the same region of Java, he would have given them a meal beyond the powers of their mental digestion. Since then our digestions have grown stronger." (Keith, "The Antiquity of Man", 1925; quoted by Lubenow)

Keith's comment, however, makes no sense. There is no obvious reason why the Wadjak skulls, which were found with a far more modern fauna than that of Java Man, should have affected its interpretation. The more plausible explanation for Dubois' subsequent silence about the Wadjak skulls is that, because they were fully modern skulls found in a fully modern fauna, they were much less significant than the Java Man skullcap.

Neither Keith, nor any other scientist as far as I am aware, has ever said that Java Man and Wadjak Man were found "at the same level", as often stated in creationist literature. This claim seems to be have been invented by creationists.

References

Gish D.T. (1985): Evolution: the challenge of the fossil record, El Cajon, CA:Creation-Life Publishers.

Fezer K.D. (1993): Creation's incredible witness: Duane T. Gish, Ph.D. Creation/Evolution Issue 33:5-21.

Lubenow M.L. (1992): Bones of contention: a creationist assessment of human fossils, Grand Rapids,MI:Baker Books.

Creationist arguments about Java Man

Duane Gish and Wadjak Man

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http://www.talkorigins.org/faqs/homs/wadjak.html, 04/28/97

Creationist Arguments: Duane Gish and Wadjak Man

It is perhaps worth examining the history of Duane Gish's claims on Wadjak Man in some detail. Gish originally claimed, in his first book on the fossil record, that

> "Dubois concealed the fact that he had also discovered at nearby Wadjak and at approximately the same level [as the Java Man skullcap] two human skulls (known as the Wadjak skulls) ... It was not until 1922, when a similar discovery was about to be announced, that Dubois revealed the fact that he had possessed the Wadjak skulls for over 30 years." (Gish 1979)

C. Loring Brace, a prominent paleoanthropologist, informed Gish in a debate in 1982 that Eugène Dubois had in fact published preliminary accounts of the Wadjak skulls in 1890 and 1892. Gish's initial error was pardonable, since Dubois' accounts were in obscure journals, and, as we shall see, legitimate scientists have made the same mistake. But Gish should, if he was interested in correcting possible errors, have asked Brace for his references. He did not, and in 1985 repeated the same claim in the next update of his book. In 1986 Brace published an article on creationist claims about *Homo erectus* (Brace 1986) in which he listed his references for Dubois' early publications on Wadjak Man. (Gish should surely have seen this article, which was published in a journal devoted to defending evolution against creationism.)

During a debate with Gish in 1992, Karl Fezer repeated Brace's claims, and showed a transparency listing Dubois' early publications on Wadjak Man. Fezer's later account of the debate also listed the references (Fezer 1993). Gish denied that these publications mentioned Wadjak Man (in effect calling Brace a liar), on the grounds that Sir Arthur Keith had claimed in 1925 that Dubois had concealed the existence of the Wadjak skulls. Keith did indeed say that, but he was apparently unaware of Dubois' early publications on Wadjak.

Despite having been not merely informed of the Dubois references, but shown them in a public debate, Gish *once again* repeated his original claim, essentially unchanged, in his next book:

> "Dubois failed to publish the fact that he had also discovered at nearby Wadjak two human skulls (known as the Wadjak skulls) ... It was not until 1922, when a similar discovery was about to be announced, that Dubois published the fact that he had possessed the Wadjak skulls for over thirty years." (Gish 1995)

Joyce Arthur, in 1996, pointed out Gish's error once more. In his response, Gish (1997) again claimed that Keith's 1925 statement, and similar ones by W. W. Howells in 1946 and 1959, showed that Dubois had not published on Wadjak, ignoring the fact that if Brace's references were correct (and Gish made no attempt to show they were not), Keith and Howells were simply wrong. Gish then had the gall to say:

> "Brace claims that Dubois had already published these previous Wadjak finds and therefore I was either ignorant or less than honest in making such a claim. If this is so, *I would like to have the documentation from Brace*." [my italics]

This account amply illustrates why Gish's "scholarship" fails to command much respect from legitimate scientists.

References

Arthur J. (1996): Creationism: bad science or immoral pseudoscience? Skeptic, 4.4:88-93.

Brace C.L. (1986): Creationists and the pithecanthropines. Creation/Evolution, Issue 19:16-23. (discusses creationist arguments about Java Man and Peking Man)

Fezer K.D. (1993): Creation's incredible witness: Duane T. Gish, Ph.D. Creation/Evolution, Issue 33:5-21.

Gish D.T. (1979): Evolution: the fossils say no! Ed. 3. San Diego: Creation-Life Publishers. (this is the third edition of a book first published in 1972 and is quite out of date)

Gish D.T. (1985): Evolution: the challenge of the fossil record. El Cajon, CA: Creation-Life Publishers. (an updated version of Gish 1979)

Gish D.T. (1995): Evolution: the fossils still say no! El Cajon, CA: Institute for Creation Research. (an updated

version of Gish 1985)

Gish D.T. (1997): Gish responds to critique. Skeptic, 5.2:37-41. (a response to Arthur 1996)

Did Dubois hide Wadjak Man?

Creationist Arguments: Java Man

Creationist Arguments: Peking Man

Creationists often claim that the Peking Man fossils are the remains of apes or monkeys eaten by real humans; that the original fossils may have been disposed of to conceal the evidence of fraud; that only models of the fossils remain; and that they are distorted to fit evolutionist preconceptions. Gish (1985) discusses Peking Man extensively, drawing most of his material from Boule and Vallois (1957). This book, which was almost 30 years old when Gish wrote, was a light revision by Vallois of a book that had originally been written by Boule another 20 years or so previously (Boule died in 1942).

Gish, citing the "fact" that the bases of the skulls had been bashed in so the brains could be extracted, states that "All authorities agree that every one of the Sinanthropus [Peking Man] individuals had been killed by hunters and eaten". That may have been true in 1957, although Boule and Vallois do not say so. It is definitely not true now. Almost all recent authorities (Jia (1990) is an exception) reject as unsupported the idea that Sinanthropus was hunted. The missing skull parts are the most fragile parts which are least likely to be preserved. It is most probable that the skulls were the prey of hyenas, the bones and feces of which were often found in the excavation.

Boule and Vallois do discuss the claims of various scientists that Sinanthropus had been eaten by modern man, or by Sinanthropus himself (i.e. cannibalism). Gish ignores the latter option and declares that since humans were responsible, Sinanthropus could not have been our ancestor, and must have been a giant ape. This is incorrect; ancestor and descendant species can coexist. So Gish's argument fails on multiple grounds: there is no proof, or even good evidence, that the Sinanthropus skulls were eaten by anyone, let alone modern humans. Even if they were, it would still not show that Peking Man was not a primitive human.

Gish's claim that the skullcaps are of apes is similarly farfetched. The largest skullcap, about 1225 cc, is twice as large as that of a large male gorilla. Any ape with a brain that size would be enormous, but no such ape has been found at Zhoukoudian or anywhere else, and the jaws of Peking Man are much smaller, and more human-like, than those of a gorilla or any other ape. The skullcaps are, however, very similar to (but larger than) those of some *Homo erectus* skulls, one of which is attached to a body that even Gish recognizes as human (the Turkana Boy). Clearly it makes more sense to assume that Peking Man belonged to the same species than to hypothesize giant apes.

Gish claims that "The features of the lower jaws described by Boule and Vallois were all apelike except for the shape of the dental arcade ...". In fact, Boule and Vallois list only 3 apelike characteristics (one of which, a receding chin, is found in many fossil humans), and 1 humanlike characteristic, but state that there are more of both. They agree with the conclusion of Weidenreich, who said the lower jaws present "a veritable intermingling of pithecoid [apelike] and human characters".

Gish similarly claims the teeth were apelike, "with very few exceptions". Boule and Vallois do state that the teeth are apelike, though not as emphatically as Gish does. They list 7 features: 3 apelike, 1 humanlike, and 3 others whose significance is unclear.

Gish does not mention the few skeletal bones that were found, probably because Boule and Vallois' discussion shows that they were all similar or identical to the same bones in modern humans, although the limb bone fragments were very thick. Boule and Vallois suspected that they might not belong to the same creatures as the skulls, but modern finds have confirmed that *Homo erectus* does have a primitive skull combined with a robust but essentially modern skeleton.

Gish concludes, based on the above, that Sinanthropus was an ape. His method of comparing the numbers of apelike and manlike characteristics is worthless, since it is totally dependent on the few features, out of the many available, that Boule and Vallois chose to mention. Gish further distorted this scanty evidence by exaggerating the number of apelike features, and omitting Boule and Vallois' frequent references to the human features and intermediate status of Peking Man.

Although Gish does not seem to have examined any of the primary documentation on Peking Man, he rejects the conclusions reached by all of the qualified scientists who have studied either the original fossils or the extensive material available on them.

His conclusion is not supported by Boule and Vallois, any of the other authors quoted by them, or any modern authorities. The opinions are divided as to whether Sinanthropus is advanced enough to be called human, but no

one considers it an ape. Boule and Vallois state that Peking Man has "physical characters intermediate between the group of Anthropoid Apes and the group of Hominians", and that there are many characters of the skull "which, if they do not yet conform exactly to the human morphological type, are singularly close to it". The conclusion of Boule and Vallois was that:

> "Morphologically,there is not the slightest doubt. *Sinanthropus* confirms and completes the proof that there are creatures with physical characters intermediate between the group of Anthropoid Apes and the group of Hominians." (Boule and Vallois, 1957)

Another claim is that only models of the fossils remain, which, because they were made by committed evolutionists, may not be accurate copies. Gish appears to be confused about the words "cast" and "model", once using them as if they were synonymous. A cast, made from a mold of the fossil, is an almost exact duplicate. Excellent casts of the Peking Man fossils were made, and are mentioned in many books, including that of the creationist author Lubenow (1992). The models of complete skulls Gish refers to may partly reflect the subjective views of their maker since missing information will have had to be guessed at, but the primary evidence of Peking Man's affinities remains the casts and extensive documentation of the original material, not models of skulls. The model in question was made by Weidenreich, using parts of at least 4 different individuals. By that time almost all of the Peking Man material had been found, and most portions of the skull were known, so Weidenreich's reconstruction is likely to be fairly accurate. The braincase was precisely known and is clearly far more similar to that of a modern human than any ape.

Gish states that since this model, shown in Boule and Vallois, differs glaringly from their earlier text descriptions, and from a model of Java Man shown earlier in the book, it is inadmissible as evidence of Peking Man's affinities. The model, which looks impressively intermediate between a gorilla and a modern human (as Gish admits), is in fact quite consistent with Boule and Vallois' description; it is "glaringly different" only from Gish's misrepresentation of Sinanthropus as an ape.

The Java Man reconstruction relied on fewer and less complete fossils, so is not as reliable. Part of the difference is probably also due to the Java Man skulls having a flatter, receding forehead compared to the more convex Peking Man skulls (Burenhult 1993) (and, in fact, a flatter forehead is the major difference between what Gish says are "glaringly different" reconstructions).

Interestingly, Gish says that if Weidenreich's model is considered accurate, *Boule and Vallois' claim that Peking Man is intermediate between ape and man could hardly be rejected*. All the evidence is that the model was accurate, but those who do not accept it should note that Weidenreich's model is strikingly similar to other *erectus* skulls such as WT 15000 and ER 3733. Therefore, these fossils are, according to Gish's own logic, *indisputable transitional forms*.

If Boule was biased, as Gish claims, it was in making Sinanthropus sound more apelike than it really was. Gish, in asserting that Peking Man was an ape, is adding to Boule's bias, rather than correcting for it. Gish nowhere explains why the discrepancy between Boule's description of a creature midway between ape and human and Weidenreich's more humanlike reconstruction provides evidence that Peking Man was an ape.

If Peking Man were an ape, Weidenreich must have been unbelievably incompetent to produce such a humanlike reconstruction. But descriptions of Weidenreich and his work often use words such as "meticulous, "compulsively careful", "detailed", and the casts he made of the Peking Man fossils are usually described as "excellent". He was a superb anatomist even by today's standards (Walker and Shipman 1996).

Gish's statement that "All we have available are the *models* fashioned by Weidenreich" is totally untrue. It not only ignores the difference between models and casts, but also the extensive documentation available. Weidenreich produced hundreds of pages of detailed monographs on the fossils, with photos, measurements, descriptions, drawings, and even X-rays.

The only way these fossils could be apes would be if Weidenreich systematically fabricated not only the skull reconstruction, but his entire body of work. Even this would not be sufficient, as the earlier fossils were photographed, described, and had casts made of them, before Weidenreich ever saw them. Other scientists also saw the original fossils. Unless there was an extraordinarily widespread conspiracy among all the people who found, worked on, photographed and saw the fossils, they are genuine. As a testimony to the accuracy of the casts, some skull parts found in 1966 fit perfectly with casts of earlier portions to make most of a skullcap.

The other source used by Gish is "Science of Today and the Problems of Genesis" (1969) by Rev. Patrick O'Connell, a Roman Catholic priest who was in China during the 1930's. O'Connell claimed that Peking Man was

a large scale fraud, which presumably would have had to involve most of the people working with the fossils, and that the fossils may have been deliberately destroyed to remove the evidence. O'Connell never visited Choukoutien, never saw the fossils, apparently had no relevant expertise, and if he had any evidence for his wild claims, Gish does not give it. Gish, while not endorsing these claims, is at least sympathetic to them. O'Connell's work appears to not have enough substance to be worth addressing.

Gish also states "Boule had visited Peking and Choukoutien and had examined the originals." C. Loring Brace, in a debate with Gish in 1982 and in a later article (Brace 1986), called this "pure invention". Boule never visited either place, and worked from photos and descriptions. Despite this correction, Gish has repeated the assertion in 1985 and 1995, and in debates as recently as 1992. (Fezer 1993)

Bowden (1981) also discusses Peking Man at length, attempting to show, based on the scientific literature, that it was a large monkey.

Bowden cites an article by Teilhard de Chardin (1930) on Skull III, in which de Chardin said that its brain size "would not be large in view of the relatively small dimensions of the skull and the considerable thickness of the bone walls". According to Bowden, Teilhard also says (this quote is actually a mistranslation):

> "Looked at from behind, the top of the skull of Sinanthropus is of grossly triangular shape like that of monkeys, rather than oval-shaped, as in man." (Teilhard de Chardin 1930)

A later article by Teilhard also listed some apelike features. Bowden considers this enough evidence to decide that "it is clear that all that had been found was the skull of a large monkey", even though de Chardin's article gives a very different impression. Bowden does no analysis to show that Sinanthropus was a large monkey. Instead, he seems to start with the assumption that transitional forms can not exist, and that any fossil with apelike characteristics must, since it is not human, be either an ape or monkey.

Bowden gives other evaluations that also mentioned the small size of the skull, and concludes that the only evidence that the skull approached 1000 cc is the measurements by Black and Weidenreich (960 and 915 cc respectively). Bowden clearly considers the above evaluations inconsistent with these measurements, despite the fact 1000 cc *is* a very small size for a modern human.

Bowden criticizes the reconstructions of the skulls on the grounds that:

> "They were always broken, generally into fairly small pieces. Only the Locus E skull [Skull III] was reasonably complete, and even that had the base missing and was badly damaged." (Bowden 1981)

This is incorrect. At least 4 of the 5 braincases were "reasonably complete" (I have not seen pictures of the 5th). Skull III was unbroken, and only lightly damaged, as Bowden himself documents:

> "Except for [Skull III], all specimens were broken into more or less small pieces ..." (Weidenreich; quoted by Bowden p.111)
>
> "The whole of the brain case of the Locus E was well preserved and not deformed, except for a damaged area around the occiput [base]." (Teilhard de Chardin, 1930; quoted by Bowden p.97)

The other skulls were in pieces, but this is common; many fossil finds have to be reassembled from fragments. Such reassembly is often a painstaking task (Richard Leakey has likened it to doing a 3-dimensional jigsaw puzzle with no edges and half the pieces missing), but it can be done, and the results are not, as Bowden claims, "a matter of many assumptions and much guesswork".

Bowden criticizes Weidenreich's model of Peking Man on the grounds that it was mostly based on Skull XI, which was "not complete, and consisted of a number of broken fragments", with extra measurements from Skulls II and XII, facial bones that were mixed with the facial bones of Skull X, and a lower jaw with one tooth found 80 ft higher. In fact, Skull XI is an almost complete braincase, with only minor gaps that are easily filled in. It is hard to see the relevance of Bowden's other points. Using extra skulls should improve the reliability of the reconstruction. Using facial parts from other fossils should not affect the accuracy unless those parts happened to be very atypical, and enough Peking Man fossils existed to avoid that problem. The distance of the lower jaw seems irrelevant if it is from the same species as the skulls.

Bowden's claim that the Peking Man skulls were not even of apes, but of monkeys, is ridiculous. Four of the five skulls are over twice the maximum brain size of a chimpanzee, and monkeys are considerably smaller than chimps. Worse, Bowden says that "in his book Fossil Men, [Boule] is clearly unconvinced that Sinanthropus was

other than a monkey", but the quote from Boule and Vallois (1957) that Bowden gives in support of his assertion implies nothing of the sort; it is Boule's claim that Sinanthropus had been hunted by humans. In fact, Boule, as the quotes given above show, made it quite clear that Sinanthropus was *not* a monkey, or even an ape, but intermediate between apes and humans.

The effort Gish and Bowden expend in discrediting Peking Man seems totally wasted, as it is all nullified by the more competent work of Lubenow (1992), another creationist. Lubenow accepts Peking Man as *Homo erectus* as a matter of course, and, although he must have been familiar with Gish and Bowden's criticisms, apparently did not consider any of them worth repeating.

Compare Peking Man with *Homo erectus*

Compare Peking Man with a monkey

A Mistranslated Quote

The Missing Ten Skeletons

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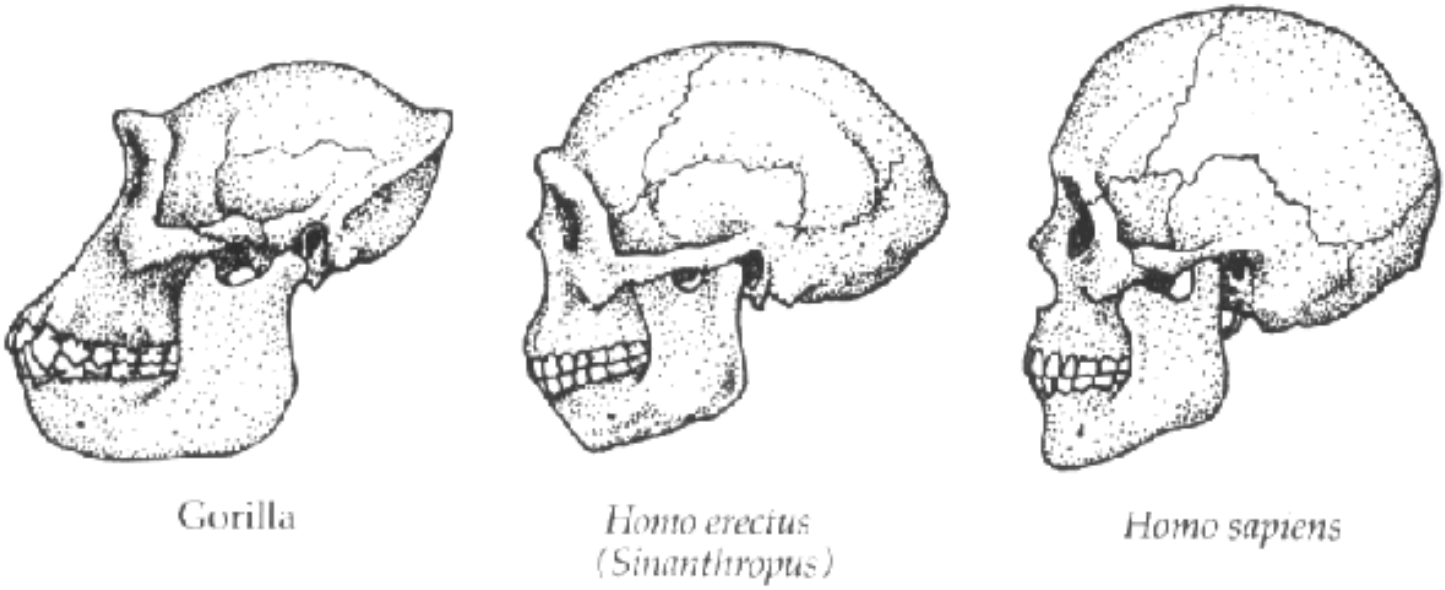
http://www.talkorigins.org/faqs/homs/a_peking.html, 04/28/97

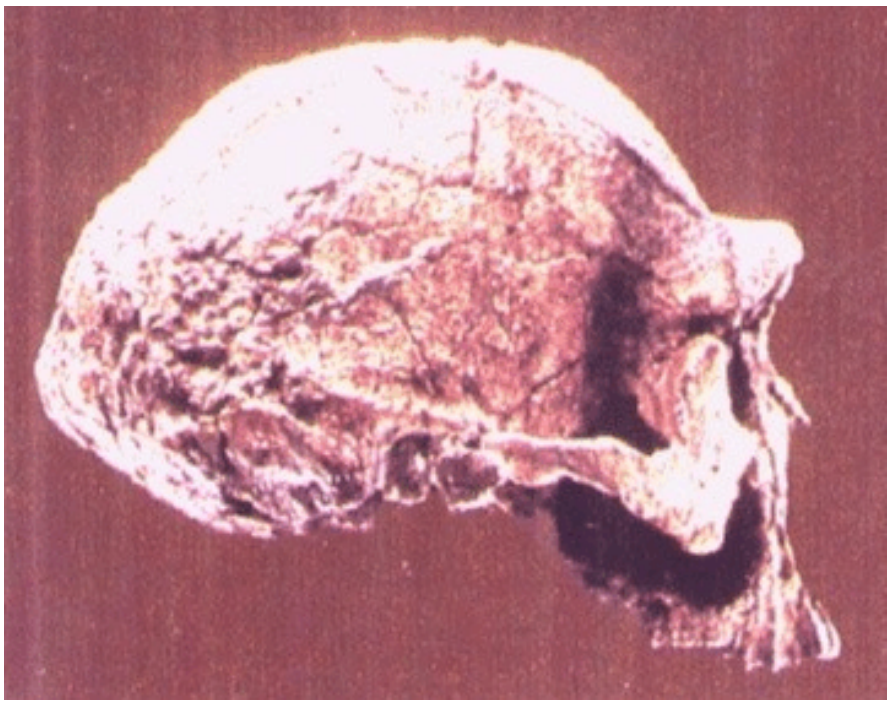
Peking Man and *Homo erectus*

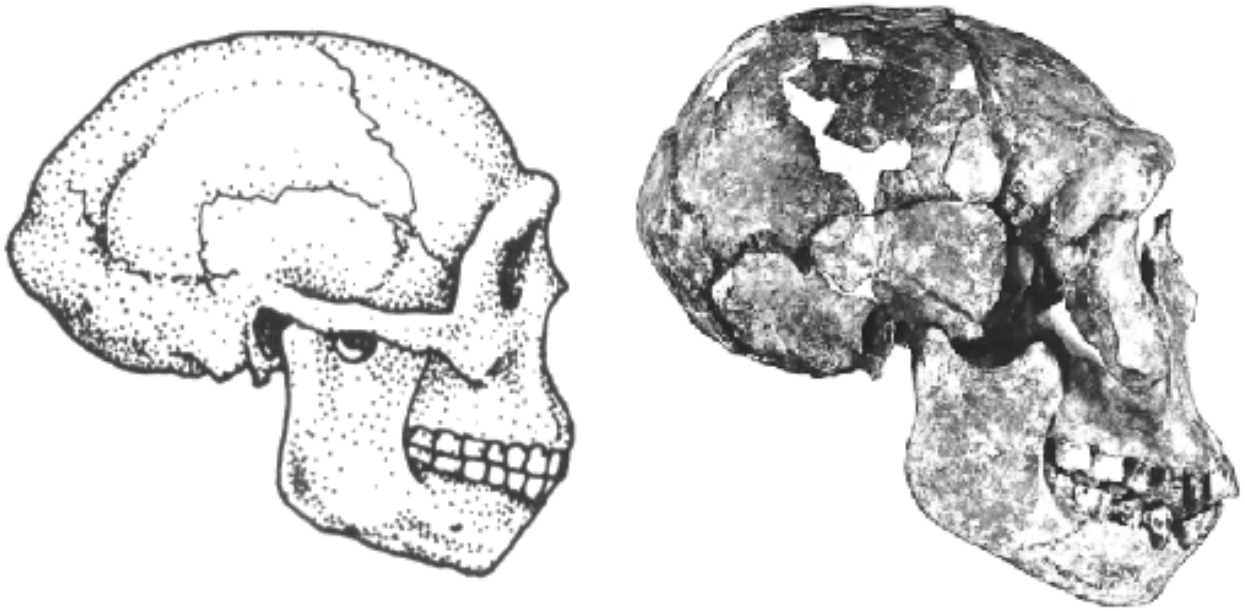


This illustration is based on a photo in Boule and Vallois (1957). The middle figure is a model of Peking Man done by Franz Weidenreich, of which Duane Gish says:

> "The reader [of Boule and Vallois, 1957] is invited to verify for himself that **Sinanthropus occupies a position intermediate between the Anthropoid Apes and Man**. If one accepts uncritically Weidenreich's model of Sinanthropus as a true portrayal of the real Sinanthropus, **then he could hardly reject the above appraisal**." (Gish, 1985) [emphasis added]

In other words, although Gish does not accept the accuracy of this model, he is saying that *if* it was accurate, it would be almost indisputable as a transitional fossil. Now compare the model with two other *Homo erectus* skulls, ER 3733 and WT 15000.





Since these *Homo erectus* skulls discovered decades later are very similar to Weidenreich's model, they should, by Gish's own admission, be accepted as intermediate between apes and humans.

Creationist arguments about Peking Man

Creationist arguments about *Homo erectus*

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Creationist Arguments: Monkeys and Peking Man

Some creationists, such as O'Connell (1969) and Bowden (1981), have claimed that the Peking Man fossils were actually those of monkeys. So that you can judge for yourself, here is the first ever, I believe, comparative photo of a monkey and Peking Man:

The skull on the left is a monkey skull. Actually, it is quite a large monkey skull, coming as it does from a baboon. The skull on the left is a reconstruction by Weidenreich based on the original Peking Man fossils. (Concerns about the accuracy of the facial part of the reconstruction can be ignored here, since we are only concerned about the braincase, which was essentially complete.)

Ask yourself: could any scientist possibly confuse the above two skulls? Heck, could any 4-year old with a modicum of intelligence?

No scientist has ever claimed the Peking Man skulls came from monkeys. Creationist claims to the contrary rely upon misrepresentations of work by scientists such as Pierre Teilhard de Chardin and Marcellin Boule. Boule was always of the opinion that Peking Man was intermediate between apes and humans. Bowden and O'Connell both claim that Boule's 1937 article in L'Anthropologie dismissed Peking Man as an ape. That is not true, as can be seen from the following quotes from that article (my translations):

> "It is nonetheless evident that, by the volume of their brain as by what we know of the anatomical structure of their skull, *Sinanthropus* and his brother *Pithecanthropus* are interposed, in the series of superior primates, between the great apes and the Hominiens".
>
> "In this regard [the development of the brain], the small new group that we are studying [Peking Man and Java Man] is exactly intermediate, since its average cerebral volume is 1000 cc, superior by 400 cc to the maximum volume of the apes, which is 600 cc, inferior by the same quantity to the current human average which is 1400 cc." (Boule 1937)

I would like to express my thanks to the staff at the American Museum of Natural History for granting me access to this material and taking this photograph.

References

Boule M. (1937): Le Sinanthrope. L'Anthropologie, 47:1-22

Bowden M. (1981): Ape-men: fact or fallacy? Ed. 2. Bromley,Kent: Sovereign.

O'Connell, P. (1969): Science of Today and the Problems of Genesis. Hawthorne, CA: Christian Book Club of America

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Creationist arguments about Peking Man

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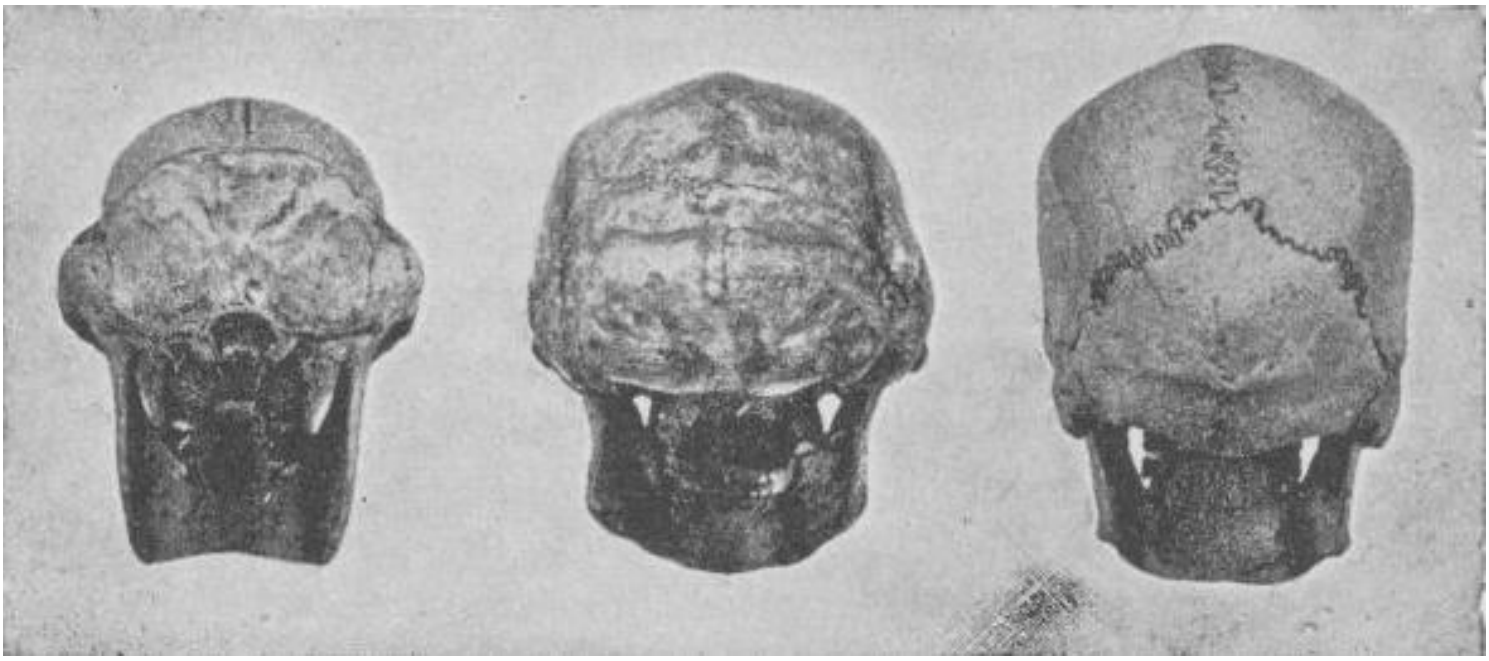
http://www.talkorigins.org/faqs/homs/monkeypeking.html, 08/14/98

Rear view of Sinanthropus



Rear views of the skulls of a female gorilla, Weidenreich's Peking Man reconstruction, and a modern human. (Taken from Fossil Men, Boule and Vallois 1957)

The following quote from Bowden (1981) is given as evidence that Peking Man is a monkey:

> "Looked at from behind, the top of the skull of Sinanthropus is of grossly triangular shape like that of monkeys, rather than oval-shaped, as in man." (Teilhard de Chardin 1930)

Teilhard de Chardin's original report on the first Peking Man skull was published in Revue des Questions Scientifiques in 1930. It and many other essays were republished in his book L'Apparition de l'Homme in 1956. The above translation was made by O'Connell (1969) from this book.

Bowden references the above quote as having come from The Appearance of Man, a 1965 English translation of Teilhard's book. However this is not the case, because in the English translation, the passage corresponding to the above quote is:

> "... viewed from the back (in 'norma occipitalis') the *Sinanthropus* skull has a roughly triangular shape (like that of the simians) rather than an ovoid one (like that of present-day men)."

Clearly, instead of using the authorized English translation of the book which he had referenced, Bowden had copied O'Connell's translation of the French version. The two versions are quite different. O'Connell says that the skull had a "grossly triangular shape like that of monkeys", while the authorized translation refers to "a roughly triangular shape (like that of the simians)".

Although I do not have a copy of the original French article, I believe I can reconstruct what has happened. In both cases, O'Connell is at fault, having made mistranslations which favored his case.

The word 'simian' can refer to both apes and monkeys, and in the context of Teilhard' article, 'apes' is certainly the intended meaning. In the original French, the word used could have been either 'simien' or 'singe'. Although the word 'singe' is usually translated as 'monkey', it can mean either 'ape' or 'monkey', since French has no word for 'ape'. 'simien', like 'simian' in English, refers to both apes and monkeys. There is no reason to believe that Boule and Vallois were comparing Sinanthropus to a monkey, rather than an ape.

More importantly, the word "grossly" was almost surely translated from French word "grossièrement". This is another mistake by O'Connell, because this word is more accurately translated as "roughly", as was done in the English translation of Teilhard's book. Thus a phrase whose original meaning was that the Peking Man skull had a roughly apelike shape (which is correct) became, after O'Connell's incompetent translation, a statement that the skull had a grossly monkey-like shape. For both O'Connell and Bowden, this statement then became a major justification for their claims that the Peking Man skull was that of a monkey.

Such a claim is breathtakingly incompetent. The cranium in question (Skull III) had a capacity of 915 cc, over twice the

size of an average chimp skull, and monkey skulls are considerably smaller than those of chimps. Any competent, or even incompetent, anatomist would instantly recognize that none of the Peking Man skulls (the others are all larger than Skull III) could possibly belong to a monkey.

O'Connell did even worse with a quote translated from Marcellin Boule (1937). According to O'Connell, Boule said:

> "To this fantastic hypothesis (of Abbé Breuil and Fr. Teilhard de Chardin), that the owners of the monkey-like skulls were the authors of the large-scale industry, I take the liberty of preferring an opinion more in conformity with the conclusions from my studies, which is that the hunter (who battered the skulls) was a real man and that the cut stones, etc., were his handiwork" (O'Connell 1969, claiming to be quoting Boule 1937)

O'Connell went on to say that Boule's verdict had been that Sinanthropus was a macaque or monkey. This is incorrect; Boule's conclusion in 1937 was that Sinanthropus had been intermediate between apes and humans:

> "It is nonetheless evident that, by the volume of their brain as by what we know of the anatomical structure of their skull, Sinanthropus and his brother Pithecanthropus are interposed, in the series of superior primates, between the great apes and the Hominiens". (Boule 1937, p.21, my translation)

O'Connell's quote is not so much a mistranslation as a fabrication. The above quote appears nowhere in Boule's article; the closest approximation is the following:

> "To this hypothesis, as fantastic as it is ingenious, I permit myself to prefer this one, which seems to me as satisfying while being simpler and more in conformity with the totality of our knowledge: the hunter was a true man, of whom we have found the stone industry and who made Sinanthropus his victim." (Boule 1937, p.20, my translation)

O'Connell's misquote, particularly the reference to "monkey-like" skulls which he had fabricated, became the major justification for Gish's later claims that Peking Man was a large monkey or ape (Gish 1979). Gish dropped the quote from his later books (1985, 1995), but did not abandon the claim which had been based upon it.

References

Boule M. (1937): Le Sinanthrope. L'Anthropologie, 47:1-22

Boule M. and Vallois H. (1957): Fossil Men. Ed. 4. New York: Dryden Press.

Bowden M. (1981): Ape-men: fact or fallacy? Ed. 2. Bromley,Kent: Sovereign.

Gish D.T. (1979): Evolution: the fossils say no! Ed. 3. San Diego: Creation-Life Publishers.

Gish D.T. (1985): Evolution: the challenge of the fossil record. El Cajon, CA: Creation-Life Publishers.

Gish D.T. (1995): Evolution: the fossils still say no! El Cajon, CA: Institute for Creation Research.

O'Connell, P. (1969): Science of Today and the Problems of Genesis. Hawthorne, CA: Christian Book Club of America

Teilhard de Chardin P. (1930): Sinanthropus pekinensis: an important discovery in human palaeontology. Revue des Questions Scientifiques, July 20: (discovery of the first Peking Man skull; reprinted in English translation in The Appearance of Man, 1965)

Creationist arguments about Peking Man

Creationist Arguments: The Lost Peking Man Skeletons

Creationist author Malcolm Bowden (1981) discusses a curious episode in the history of Peking Man, and argues that scientists committed a colossal fraud by hiding the existence of ten skeletons.

The initial reports

In the middle of December 1929, some newspapers reported that ten skeletons had been discovered at the Peking Man site of Chou Kou Tien (now Zhoukoudian) in China. The Daily Telegraph of London (Dec 16 1929, p.11) and the New York Times both published lengthy articles about the supposed discovery. (I have not yet been able to obtain the *Daily Telegraph* article.)

According to the New York Times of Dec. 16, 1929,

> "The discovery in a cave near Peking of the fossilized bones of ten men, who possibly lived 1,000,000 years ago, as reported by scientists representing the Rockefeller Foundation and the Geological Survey of China, is held here to excel in interest all previous findings of this kind.
> Of paramount importance is the discovery of a perfect skull, now in the possession of Dr. Davidson Black, a Canadian paleontologist, which, it is asserted, bears characteristics showing that even at the beginning of the ice age there existed men with the power of thinking and who, unlike the "ape men," walked erect.
> From the fact that the ten skeletons lay huddled together in the cave, found in a field at Chou Outien [sic], thirty miles from Peking, the scientists hold that they led a community life." (Anon. 1929a)

Further on, the NYT article refers to "ten skeletons unearthed simultaneously with an unbroken skull", and says that "Nine of the skeletons were headless".

The prominent journal Nature (Anon. 1929b) made similar but more modest claims, referring only to "the fossilized fragments of ten more examples of *Sinanthropus*", and "remains of ten individuals".

On December 28th 1929 [1], a conference was held at the offices of the Geological Survey of China. There were no skeletons, let alone ten of them. What was shown to the audience of scientists and journalists was a partial skull, consisting of most of the braincase but almost none of the face, that had been found at Zhoukoudian on December 2nd by W. C. Pei, the young Chinese scientist in charge of excavation at the site. Even this find was enough to make news around the world.

Where did the reports of 10 skeletons come from?

Although at least two newspapers published accounts of the "ten skeletons", they were not independent accounts. Both of these articles, and the Nature article, seem to have been based on the same source, a cable which according to Nature (Anon. 1929b) was sent on Dec 15th, presumably from Peking to London. It does not seem to be known, however, who sent the cable (possibly Davidson Black, but it might have been someone else in Peking), what its contents were, or to whom it was sent. There appear to be no other contemporary, primary sources which claim that ten skeletons existed.

Importantly, because the text of the cable is now unknown, we do not even know whether it actually claimed that ten skeletons existed, so in fact there are *no* reliable sources documenting the existence of the skeletons. The contents of the Nature article suggest that the cable did not explicitly say ten skeletons had been discovered, because Nature referred only to "fossilised fragments" and "remains", of unspecified completeness, of ten individuals. It seems more likely that the cable made a similar claim, and that the newspapers misinterpreted it to

mean that ten *complete* skeletons had been found, than that the cable referred to ten skeletons and *Nature* chose to downplay them by describing them merely as fragments. (As many scientists will testify, newspapers have a habit of sensationalizing science stories and getting the details wrong.)

In addition, the description of the ten skeletons did not seem plausible to many of the scientists asked to comment on the reports. The NYT said:

> "Sir Arthur [Keith, of England] smiled a little incredulously when told that the remains of ten men had been discovered.
> 'Discoveries are not made in this way,' he said."

In another NYT article the following day, American scientist Walter Granger expressed some caution about the reported finds, saying that "If the reports are true, ..." (Anon. 1929c). Another New York Times article on Dec 18th expressed stronger doubts from Ales Hrdlicka, America's premier physical anthropologist. According to the NYT, several scientists had ventured that, because of the number of skeletons supposedly found and the fact that nine of them were headless, "the cases do not have the earmarks of ancient discoveries" (Anon. 1929d).

Finally, there is other evidence that no skeletons existed. Soon after the braincase was discovered on December 2nd but apparently before the December 15th cable was sent, Davidson Black wrote a letter to Grafton Elliot Smith in England. The part of the letter describing the discovery of the braincase is quoted in Jia and Huang (1990). In it, Black excitedly talks about the discovery of the "greater part of an uncrushed adult *Sinanthropus* skull!", but there is no mention of any skeletal material, as there surely would have been had a find as significant as ten skeletons been made. We can be fairly sure this letter was written before December 15, because according to Jia and Huang, Black lost no time in sending it after receiving the skullcap, and in his letter, Black says that he intends to send cables announcing the good news.

The lack of skeletons is confirmed by an account from Roy Chapman Andrews, the American explorer who led expeditions into the Gobi Desert of Mongolia. According to Andrews, at a social function in "early December [1929]", Black said to him "Roy, we've got a skull. Pei found it on December 2." (Andrews 1945). Andrews returned to Black's laboratory and examined the specimen, but made no mention of any skeletal remains.

Bowden's explanation

Bowden's explanation of the non-appearance of the ten skeletons after they had been reported is that they really existed, but were suppressed by the scientific establishment because they did not provide the hoped-for evidence of human evolution:

> "What could have bought about this disappearing act? It seems to me that the experts, ever keen to publicize their discoveries, appear to have despatched a hurried cable to the world's newspapers. Closer inspection, however, probably showed that the skeletons were far too human for a claim to be made that they were halfway between man and ape. It may therefore have been decided to ignore them completely, and to publicize only the ape skull which Pei is said to have discovered in the lower 'cave'." (Bowden 1981)

Instead of showing that the skeletons actually did exist, Bowden begs the question by assuming it. His explanation is incredible for many reasons. First, it requires that all of the scientists involved were willing to commit a major fraud, destroy fossils, and lie about it. This list would include Black, the French paleontologist and Jesuit priest Teilhard de Chardin, the Chinese excavator W. C. Pei, and the many other Chinese scientists involved with the site.

Second, as described in Jia and Huang (1990), the excavation, transport, and preparation of the skullcap alone involved a significant amount of effort, and even by the end of December, it was still partly embedded in hard rock. It seems unlikely that such a large body of material as ten skeletons could be excavated and sufficiently analyzed in the space of only three weeks to determine that they were too human to be evidence of evolution.

Third, even if they could be so analyzed, it is almost inconceivable that any, let alone all, of the scientists involved would have willingly destroyed them. No matter what the skeletons belonged to, a discovery of such spectacular size and completeness would have made the career of any scientist involved with them.

Fourth, Zhoukoudian was a large site with dozens of workers, many of whom would have had to be involved in

the extraction of the skeletons, and all of whom would have been at least aware of such a major discovery at the site. Suppressing knowledge of the existence of the skeletons would be impossible when so many people knew of them.

Finally, there is no mention of any skeletal material in the letter sent by Davidson Black to Elliot Smith, which was apparently written before it was supposedly decided to do away with the skeletons, or in Roy Andrews' book.

The evidence is far too weak to support Bowden's dramatic conclusion of widespread fraud and conspiracy. There is much evidence arguing against this conspiracy. The only evidence for it is the claimed existence of the ten skeletons, and, as discussed above, the evidence for this is itself very slender. Instead of attempting to prove that the skeletons existed, Bowden has assumed it.

The conspiracy of silence

Bowden also questions why, after the December 28 conference in which one skull was presented instead of the reported ten skeletons, no one asked what had happened to them:

> "What actually happened?
> *Nothing whatsoever -- absolute silence!*
> These skeletons are simply not referred to in *any* report, periodical or reference book dealing with Pekin Man! It is as if these headlines had never existed."

Later he says:

> "This strange incident does raise one question. Why has no 'scientist', author or journalist of integrity ever referred to these reports of ten skeletons and questioned what happened to them?" (Bowden 1981)

These statements are incorrect. It turns out that at least two scientists addressed the rumors about the ten skeletons. Moreover, they did so in a source that Bowden references in his discussion of the ten skeletons, an article written by French scientist Marcellin Boule for the journal *L'Anthropologie* (Boule 1929). Boule says:

> "Between then and now, excavations continued at Choukoutien with such success that, around the middle of December 1929, the English newspapers made a big noise of the new finds, while moreover reporting them inaccurately and exaggerating them. Thus the Daily Telegraph of December 10 1929 [sic; should be Dec 16], for example, announced the "discovery of *ten* petrified skeletons dating back to a million years and representing the ancestors of the human species. The newspaper then gave interviews with diverse scientific notables of London, notably [Sir Grafton] Elliot Smith. After having declared that the discovery from Peking was the most important to this day in human paleontology, the English scientist added: ..." [2] (Boule 1929, p.456)

Later in the same article, Boule refers to a letter he received from Teilhard de Chardin which gave details on the new discovery:

> "And, some days after [receiving a cable on Dec 28, 1929], I indeed received by post, from my scientific collaborator and friend M. Teilhard de Chardin, some precise details on the new finds. Unfortunately it was not about ten skeletons, but a cranial skullcap, moreover very interesting, as we are going to see:"[3] (Boule 1929, p.456)

It turns out that Teilhard's letter, partially reproduced in Boule's article, is also important because it suggests a plausible source for the reports of the skeletons:

> "My impression is that the fissure containing *Sinanthropus* (Black estimates that there are traces of at least 10 individuals) is, ..." [4] (Teilhard de Chardin, quoted in Boule 1929, p.458)

It is not too difficult to imagine that a preliminary report saying something similar was misunderstood, or that the important qualifier "traces" was omitted as the report got passed along, and resulted in a reporter assuming that the ten individuals were actually ten skeletons.

Finally, Boule's article also contains some relevant information from Davidson Black. Black had sent Boule the

text of a communique he had written for the press, which Boule reproduced in its entirety in the original English. In it, Black stated:

> "Contrary to any reports wich [sic] have been circulated, no skeletal parts other than the skull and numerous isolated teeth have been recovered during this year's excavations." (Black, quoted in Boule 1929, p.458)

Conclusions

In summary,

- There really were newspaper reports in mid-December 1929 that ten skeletons had been discovered at the Peking Man site of Zhoukoudian, but no skeletal material was presented at a press conference held two weeks later in Peking.
- There is no good evidence that the skeletons ever existed. The only evidence for them is newspaper accounts based on another source, of unknown accuracy and origin, which has probably been lost.
- Bowden's claim that the skeletons existed but were suppressed is not only wildly improbable, but not supported by other evidence (Black's letter to Elliot Smith).
- Bowden's claim that no one ever referred to these skeletons after they failed to appear is also false. One of Bowden's own sources (Boule 1929) not only contains statements from both Boule and Black that the skeletons never existed, but suggests a probable source for the story.
- It is overwhelmingly likely that the story of the ten skeletons came from a journalistic misunderstanding of a reference to the discovery of fragments of ten individuals at Chou Kou Tien.

Footnotes

1. This conference was to be on December 23rd, according to the Daily Telegraph, and on December 29th, according to Nature. However the date on which it actually occurred was December 28 (Jia and Huang 1990).

2. "Entre temps, les fouilles se poursuivaient à Chou-Kou-Tien et avec un succès tel que vers le milieu de décembre 1929, les journaux anglais faisaient grand bruit des nouvelles trouvailles, en les rapportant d'ailleurs infidèlement et en les amplifiant. C'est ainsi que le Daily Telegraph du 10 décembre 1929 [sic; should be Dec 16], par exemple, annoncait la "découverte de *dix* squelettes pétrifiés remontant à un million d'années et représantant les ancêtres de l'espèce humaine". Le journal donnait ensuite des interviews de diverses notabilités scientifique de Londres, notamment d'Elliot Smith. Après avoir déclaré que la découverte de Pékin était le plus important faite à ce jour in Paléontologie humaine, le savant anglais ajoutait: ..."

3. "Et, quelques jours après, je recevais, en effet, par la poste,de mon savant collaborateur et ami, M. Teilhard de Chardin, des détails précis sur les nouvelles trouvailles. Il ne s'agissait malheureusement pas de dix squelettes, mais d'une calotte cranienne, d'ailleurs très intéressante, comme on va le voir: ..."

4. "Mon impression est que la fissure à *Sinanthropus* (Black estime qu'on a les traces d'au moins dix individus) est, ..."

All translations were done by the author.

References

Anon. (1929a): 'Missing link' seen in find near Peking; scientists stirred. *New York Times,* (Dec 16 1929): 1,10.

Anon. (1929b): Pleistocene man in China. *Nature*, (Dec 28 1929) 124:973-4.

Anon. (1929c): Sees aid in fixing 'cradle of man'. *New York Times,* (Dec 17 1929): 31

Anon. (1929d): Thinks Peking bones may not be very old. *New York Times*, (Dec 18 1929): 21

Andrews R.C. (1945): Meet your ancestors. New York: Viking Press.

Boule M. (1929): Le Sinanthropus. *L'Anthropologie*, 39:455-60.

Bowden M. (1981): Ape-men: fact or fallacy? Ed. 2. Bromley,Kent: Sovereign.

Jia L. and Huang W. (1990): The story of Peking man. Beijing: Foreign Languages Press.

Creationist Arguments: Piltdown Man

No creationist who discusses the human fossil record avoids mentioning Piltdown Man. Piltdown Man (Eoanthropus dawsoni) was discovered in England by an amateur, Charles Dawson, between 1908 and 1912. It consisted of parts of a surprisingly modern-looking skull associated with a surprisingly apelike lower jaw. Later fragments found in 1913 and 1915 also seemed to have a mixture of ape and human characteristics, and quelled suspicion that the original bones were from two unrelated creatures. In 1953 Piltdown was discovered to be a hoax, consisting of a modern human skull and an orang-utan jaw. Well before then, Piltdown had become a puzzling anomaly when compared to all other hominid fossils, and the scientific community was relieved to be able to forget about it.

The paleontological community was horribly embarrassed by the uncovering of Piltdown, and justifiably so. A number of scientists had made what were in retrospect extremely foolish statements about the skull, elaborating on its "unmistakably apelike characteristics." Piltdown's acceptance was probably helped by the fact that it conformed to prejudices about what a primitive human skull would look like. In fact a number of scientists did believe that the cranium and jaw were not from the same creature, but no-one had suspected forgery.

See the Piltdown Man Home Page for further information.

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http://www.talkorigins.org/faqs/homs/a_piltdown.html, 04/28/97

Creationist Arguments: Nebraska Man

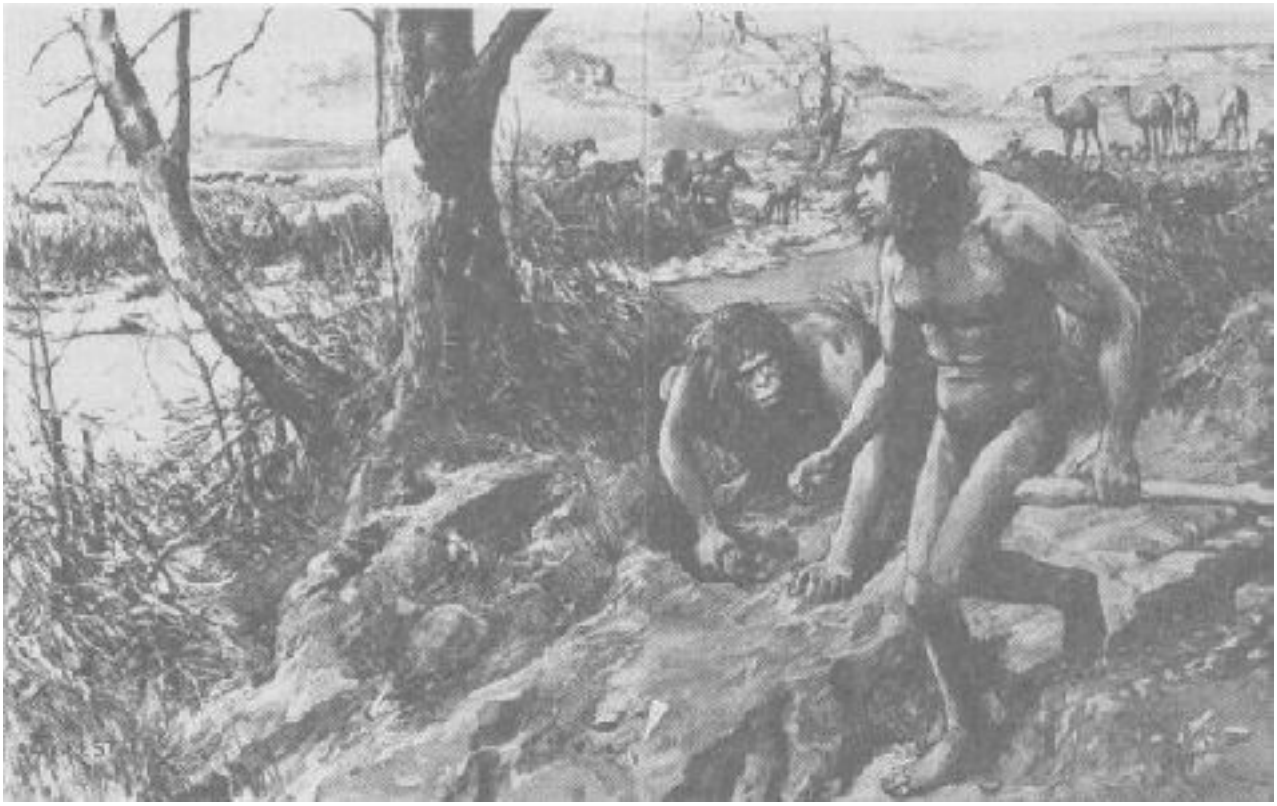
Nebraska Man (Hesperopithecus haroldcookii) was named after a humanlike tooth was found in Nebraska in 1921 (Osborn 1922). As creationists tell it, evolutionists used one tooth to build an entire species of primitive man, complete with illustrations of him and his family, before further excavations revealed the tooth to belong to a peccary, an animal similar to (and closely related to) pigs.

The Nebraska Man tooth, as shown in the Illustrated London News, June 24, 1922

The true story is much more complex (Wolf and Mellett 1984; Gould 1991). The imaginative drawing was the work of an illustrator collaborating with the scientist Grafton Elliot Smith, and was done for a popular magazine, not for a scientific publication. Few, if any, other scientists claimed Nebraska Man was a human ancestor. Some, including Osborn and his colleagues, identified it only as an advanced primate of some kind. Most others were skeptical even of that. It is not true that Nebraska Man was widely accepted as an ape-man, or even as an ape, by scientists, and its effect upon the scientific thinking of the time was negligible. For example, in his two-volume "Human Origins" (1924), George MacCurdy dismissed Nebraska Man in a single footnote:

> "In 1920 [sic], Osborn described two molars from the Pliocene of Nebraska; he attributed these to an anthropoid primate to which he has given the name *Hesperopithecus*. The teeth are not well preserved, so that the validity of Osborn's determination has not yet been generally accepted."

Identifying the tooth as belonging to a higher primate was not as foolish as it sounds. Pig and peccary cheek teeth are extremely similar to those of humans, and the specimen was worn, making identification even harder.



The infamous illustration of Nebraska Man done for the Illustrated London News by Amedee Forestier

Creationists often ridicule the Nebraska Man illustration, of two humanlike but extremely bestial creatures, done by Amedee Forestier for the Illustrated London News (Smith 1922). They rightly point out that an animal cannot be reconstructed from one tooth. But the drawing was never intended, or claimed, to be accurate or scientific, and it was based more on the Java Man fossil than on the tooth. Smith emphasized (the following quote was in both the main text *and* below the drawing) its speculative nature:

> "Mr. Forestier has made a remarkable sketch to convey some idea of the **possibilities** suggested by this discovery. **As we know nothing** of the creature's form, his reconstruction is merely the expression of an artist's brilliant **imaginative** genius. But **if**, as the peculiarities of the tooth suggest, *Hesperopithecus* was a primitive forerunner of *Pithecanthropus*, he **may** have been a creature such as Mr. Forestier has depicted." (Smith 1922) (emphasis added)

Osborn, who had named Hesperopithecus, was less impressed with Forestier's artistic efforts, and remarked that

> "such a drawing or 'reconstruction' would doubtless be only a figment of the imagination of no scientific value, and undoubtedly inaccurate." (quoted in Wolf and Mellett (1984))

Smith may have been the only major scientist who was enthusiastic about Nebraska Man's hominid status, but in his book "The Evolution of Man" he was more cautious than in the ILN article. Although he stated that

> "I think the balance of probability is in favour of the view that the tooth found in the Pliocene beds of Nebraska may possibly have belonged to a primitive member of the Human Family" (Smith 1927),

Smith also recognized that Hesperopithecus was "questionable", and admitted that

> "The suggestion that the Nebraska tooth (*Hesperopithecus*) may possibly indicate the existence of Mankind in Early Pliocene times is, as I have explained in the Foreword, still wholly tentative. The claim that real men were in existence in Pliocene and Miocene times must be regarded as a mere hypothesis unsupported as yet by any adequate evidence." (Smith 1927)

Creationists often claim that Nebraska Man was used as proof of evolution during the Scopes Monkey Trial in 1925, but this claim is apocryphal. No scientific evidence was presented at the trial. (Some evidence was read into the trial record, but even this did not refer to Nebraska Man.)

Nor is it true, as Ian Taylor (1995) has said, that the retraction of the original identification was not publicized and never made the headlines. Bowden (1981) similarly states that "Little publicity was given to the discovered error". In fact, The New York Times and The Times of London both announced the news (the NYT put it on the front page), and both also printed editorials about it (Wolf and Mellett 1984). Taylor's other claim, that the retraction was announced in the scientific literature in only four lines in the back pages of Nature, is almost correct (it was 16 lines) but highly deceptive, since it conceals the fact that a one and a half page article retracting the claim was printed in the prestigious journal Science (Gregory 1927). Moreover, Taylor should have known about this article, because it was referenced by the item in Nature to which he did refer.

Nebraska Man should not be considered an embarrassment to science. The scientists involved were mistaken, and somewhat incautious, but not incompetent or dishonest. The whole episode was actually an excellent example of the scientific process working at its best. Given a problematic identification, scientists investigated further, found data which falsified their earlier ideas, and promptly abandoned them (a marked contrast to the creationist approach).

References

Gregory W.K. (1927): Hesperopithecus apparently not an ape nor a man. Science, 66:579-81. (identified the Nebraska Man tooth as belonging to a peccary)

Gould S.J. (1991): An essay on a pig roast. In Bully for brontosaurus. (pp. 432-47). New York: W.W.Norton.

Osborn H.F. (1922): Hesperopithecus, the anthropoid primate of western Nebraska. Nature, 110:281-3.

Smith G.E. (1922): Hesperopithecus: the ape-man of the western world. Illustrated London News, 160:942-4.

Smith G.E. (1927): The evolution of man. Ed. 2. London: Oxford University Press.

Taylor I. (1995): Nebraska man goes to court. Science, Scripture and Salvation (ICR radio show), Jul 8:

Wolf J. and Mellett J.S. (1984): The role of "Nebraska man" in the creation-evolution debate. Creation/Evolution, Issue 16:31-43. (the best reference on the Nebraska Man episode)

Thanks to Chris Nedin for obtaining the hard-to-find Illustrated London News article on Nebraska Man.

Creationist articles

Early Man Fossils: Nebraska Man

Nebraska Man, by Jon Scott

Ian Taylor and Nebraska Man

The following excerpt comes from the July 8, 1995 broadcast of Science, Scripture, and Salvation, the ICR radio program. Creationist author Ian Taylor was being interviewed by Jim Long:

> **Jim Long:** "So I'm guessing that even though it [Nebraska Man] was proven to be a fraud, the public didn't hear too much about that."
>
> **Ian Taylor:** "No of course that didn't make the headlines. This was in 1927 when that was announced but it was announced in sort of the back pages. Actually in Nature, which is one of the scientific journals, I think it took 4 lines in one of the back pages to say that there had been a 'misinterpretation'. Very nice, but it didn't get headlines."

Even for creationists, this exchange contains an impressive number of errors in only a few sentences.

Nebraska Man was not a fraud, but an honest mistake. In an apparent attempt at smear by repetition, Long and Taylor refer to it as a fraud no fewer than four times in this interview.

The correct identification of Nebraska Man as a peccary was not hushed up, in either the popular press or the scientific literature. It made headlines and editorials in major newspapers such as the *New York Times* and the London *Times*. (Wolf and Mellett, 1984)

The paragraph in Nature was published Jan 28, 1928. It was 16 lines long, not 4, and does not refer to a "misinterpretation".

Taylor's clear implication that the paragraph in Nature was the *only* announcement in the scientific literature is also wrong. Science had a one and a half page article on the correct identification of Hesperopithecus (Gregory, 1927). Furthermore, Taylor should have been aware of this article, because the paragraph in Nature contains a reference to it. Either Taylor's research is so sloppy that he has not actually read the paragraph in Nature to which he referred, or he deliberately chose to deceive listeners by not mentioning the Science article.

References

Gregory W.K. (1927): Hesperopithecus apparently not an ape nor a man. Science, 66:579-81. (identifies the Nebraska Man tooth as belonging to a peccary)

Taylor I. (1995): Nebraska man goes to court. Science, Scripture and Salvation (ICR radio show), Jul 8:

Wolf J. and Mellett J.S. (1984): The role of "Nebraska man" in the creation-evolution debate. Creation/Evolution, Issue 16:31-43.

Creationist arguments about Nebraska Man

Creationist Arguments: Orce Man

Gish (1985) tells the story of "Orce Man", a fossil discovered in 1982 near the Spanish town of Orce and claimed to be a human cranial fragment. The fossil comes from the Venta Micena site, and is designated VM-0. A symposium on it was planned for late May, 1984. Earlier that month, says Gish (citing a UPI news report from May 14, 1984):

> "When French experts revealed the fact that "Orce Man" was most likely a skull fragment from a four-month-old donkey, embarrassed Spanish authorities sent out 500 letters cancelling invitations to the symposium."

Two French scientists had suggested the fragment "may have come" from a donkey. Another scientist quoted in the news report admitted there was some doubt as to the bone's identity, but thought it was still quite likely human. A third scientist quoted in another news report from Associated Press claimed it was definitely humanoid. Instead of it being a "fact" that the fragment is "most likely" a donkey, a fairer assessment would be that it was still unidentified, but possibly an equid (not necessarily a donkey).

By the next paragraph, Gish is exaggerating even further, and is calling the disputed fragment a "donkey's skull". It is not a skull, and it was not necessarily from a donkey.

It is easy to score cheap rhetorical points by implying that scientists are so incompetent that they cannot tell the difference between a human and a donkey. A more charitable explanation, which turns out to be the correct one, is that the bone is genuinely difficult to identify, as proved by the fact that debate over its status has continued for over 10 years.

A fractal analysis of the skull sutures by Gibert and Palmqvist (1995) strongly indicated that the fragment was not from an equine. Also in 1995, an international symposium was eventually held at Orce to discuss this and other material, and a number of workers there also suggested that VM-0 was a hominid fossil (Zihlman and Lowenstein 1996).

Two articles appearing in July 1997 disputed that claim, however. Palmqvist (1997), citing errors in the paper that he had coauthored with Gibert, now claimed that the fractal evidence was clearly in favor of an equid origin for VM-0, and Moya-Sola and Kohler (1997) made the same claim based on an anatomical study. Even this has not resolved the debate, because a later paper (Borja et al. 1997) has argued in favor of VM-0 being a hominid, based on immunological studies of fossil proteins performed at two independent laboratories. For now, it would seem safest to make no firm conclusions about the identity of VM-0 or the other possible hominid fossils from Orce.

"Orce Man" is important because, if valid, it would be the earliest human fossil in Europe. In most circumstances, such a scrappy fossil would have received little attention. Some mistakes were made in its analysis, but that is an inevitable result of the scientific process, especially when the evidence is so ambiguous. Importantly, scientists have continued to work to answer the doubts about the fossils. And, whatever the status of the fossils, they do not affect the validity of the rest of the evidence for human evolution.

References

Borja C., Garcia-Pacheco M., Olivares E.G., Scheuenstuhl G., and Lowenstein J.M. (1997): Immunospecificity of albumin detected in 1.6 million-year-old fossils from Venta Micena, in Orce, Granada, Spain. American Journal of Physical Anthropology, 103:433-41.

Gibert J. & Palmqvist P. (1995): Fractal analysis of the Orce skull sutures. Journal of Human Evolution, 28:561-75.

Gish D.T. (1985): Evolution: the challenge of the fossil record. El Cajon, CA: Creation-Life Publishers.

Moya-Sola S. and Kohler M. (1997): The Orce skull: anatomy of a mistake. Journal of Human Evolution, 30:91-7.

Palmqvist P. (1997): A critical re-evaluation of the evidence for the presence of hominids in lower Pleistocene times at Venta Micena, southern Spain. Journal of Human Evolution, 33:83-9.

Zihlman A.L. & Lowenstein J.M. (1996): A Spanish Olduvai? Current Anthropology, 37:695-7. (report on an international paleoanthropology conference at Orce)

Offsite: 1.8 million-year-old human presence claimed in Spain (an article from British Archaeology)

Offsite: International Symposium on Human Paleontology, Orce, September 1995

Offsite: International Symposium on Human Paleontology, Orce, September 1995 (in Spanish)

Thanks to Boyce Rensberger for obtaining a number of news reports about "Orce Man".

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http://www.talkorigins.org/faqs/homs/a_orce.html, 11/11/97

Creationist Arguments: Neandertals

Creationists often point out, correctly, that Neandertals were human, but they tend to exaggerate their similarity to modern humans:

> "The creationists in those days [the 1860's] responded 'Now wait a minute. Neanderthals are just plain people, some of whom suffered bone disease'"
> "Nowadays, evolutionists agree with creationists: Neanderthals were just plain people, no more different from people living today than people than one living nation is different from another." Parker in (Morris and Parker 1982).

> "Nowadays, Neanderthal Man is classified as *Homo sapiens*, completely human" (Huse 1983).

Actually, Neandertals are usually classified as *Homo sapiens neanderthalensis*, a subspecies of humans, in recognition of consistent differences such as heavy brow ridges, a long low skull, a robust skeleton, and others. (Some scientists believe the differences are large enough to justify a separate species, *Homo neanderthalensis*.) Evolutionists last century claimed that these were real differences between us and Neandertals, and they were right. Creationists claimed that the differences were a result of various diseases or environmental factors, and they were wrong. For Parker to claim that creationists won this debate is a rewriting of history.

Amazingly, a century after scientists knew otherwise, most creationists still believe that Neandertals were merely modern humans, deformed by diseases such as rickets, arthritis or syphilis. Some, but by no means all, Neandertals have been found with signs of health problems such as arthritis. But Neandertals have many distinctive features, and there is no reason why these diseases (or any others) would cause many, let alone all, of these features on even one, let alone many, individuals. Modern knowledge and experience also contradicts the idea that disease is a cause of Neandertal features.

Last century the famous pathologist Rudolf Virchow was one who claimed that the first Neandertal fossil found was of a rickets sufferer. As Trinkaus and Shipman (1992) point out, Virchow, an expert on rickets, should have been the first to realize how ridiculous this diagnosis was. People with rickets are undernourished and calcium-poor, and their bones are so weak that even the weight of the body can cause them to bend. The bones of the first Neandertal, by contrast, were about 50% thicker than those of the average modern human, and clearly belonged to an extremely athletic and muscular individual.

Lubenow (1992), relying on the authority of Virchow and Ivanhoe (1970), claims that Neandertals (and *H. erectus* and the archaic *sapiens*) were caused by a post-Flood ice age: heavy cloud cover, the need to shelter and wear heavy clothes, and a lack of vitamin D sources, would all have combined to cause severe rickets.

This explanation fails for many reasons:

- Rickets does not produce a Neandertal, or *Homo erectus* morphology; it is clear from many sources (Reader 1981; Tattersall 1995) that the original Neandertal skeleton was unlike any previously known, even in a century in which rickets was a common disease.
- Evidence of rickets is easily detectable, especially on the growing ends of the long bones of the body. Radiology courses routinely teach the symptoms. It has never (so far as I know) been detected in Neandertals or *Homo erectus*.
- Even Virchow did not claim rickets as a sole cause. Virchow in 1872 decided that the first Neandertal Man fossil had had rickets in childhood, head injuries in middle age, and chronic arthritis in old age. A whole population of such people strains credibility, to say the least, although Lubenow says that this diagnosis "is as valid today as when [Virchow] first made it".
- The long bones of Neandertals, like those of rickets victims, are often more curved than normal, but rickets causes a sideways curvature of the femur, while Neandertal femurs curve backwards (Klein 1989).
- Humans could hardly have stayed in shelter all the time; food gathering would have required them to spend a lot of time outside (and probably a lot more time than most modern urban humans).
- The most extreme differences from modern humans (*H. erectus*) are mostly found in regions such as Africa and Java, which were always tropical; the reverse of what would be predicted by Lubenow's hypothesis.
- Creationists usually claim that most of the fossil record was laid down by the Noahaic Flood. And yet there

> are hundreds of fossils of "post-Flood" humans, who supposedly lived in a period of low population and little fossilization. Why, underneath these post-Flood humans, do we not find far larger numbers of fossilized pre-Flood humans?

Lubenow claims that modern scientists do not consider rickets as a cause of Neandertalism because it is a virtually unknown disease nowadays. This is not true. Although not as common as it used to be, rickets has other causes besides vitamin D deficiency and still occurs. Information on it is common in medical textbooks (and even on the web), and the symptoms bear no apparent similarity to the Neandertal skeleton or skull.

Ironically enough, one of the best refutations of the idea that Neandertalism is caused by diseases such as rickets, syphilis or arthritis, is by a creationist author, Jack Cuozzo (1998, pp.275-279). As Cuozzo documents, the symptoms of these diseases bear very little resemblance to the features of Neandertals. (See also a review of Cuozzo's book Buried Alive by Colin Groves.)

Creationists sometimes imply that a paper by Straus and Cave (1957) showed that Neandertals were identical to modern humans. Straus and Cave overturned the stereotype, created by Boule, that Neandertals were semi-erect ape-men with a shambling gait and a divergent big toe, and showed instead that their posture was identical to ours. However their conclusions applied only to posture, and they did not claim that Neandertals were identical to modern humans; in fact quite the opposite:

> "This is not to deny that his limbs, as well as his skull, exhibit distinctive features - features which collectively distinguish him from all groups of modern men. In other words, his "total morphological pattern", in the phraseology of Le Gros Clark (1955) differs from that of "sapiens" man." (Straus, Jr. and Cave 1957)

The exhibit on Neandertals at the ICR (Institute for Creation Research) Museum says (or used to say):

> "Many Neanderthal features are similar to those in elderly humans today. Since humans lived to great ages in the initial generations after the flood and Babel, perhaps the features are primarily due to advanced age ...".

In fact, the distinctive features of Neandertals, least of all the powerful bones and muscles, seem to bear little resemblance to those of old people. This argument is particularly implausible because even Neandertal children are distinctive. Whoever wrote this presumably also thinks that Neandertals are arthritic modern humans.

At least two evolutionary scientists have revived the idea that Neandertal morphology may be a result of congenital diseases such as rickets (Ivanhoe 1970) or syphilis (Wright 1971). According to Day (1986), neither of these cases was adequately supported or subsequently justified. Both claims seem to have sunk without a trace except among creationists, who often cite them. Gish goes even further, dishonestly implying that even the scientific community accepts these claims:

> "They have now concluded that these primitive features of Neandertal people were not genetic, they were pathological." (Gish 1985)

Straus and Cave (1957) made a striking comment about Neandertals:

> "Notwithstanding, if he could be reincarnated and placed in a New York subway - provided that he were bathed, shaved, and dressed in modern clothing - it is doubtful whether he would attract any more attention than some of its other denizens".

This may be a source of the creationist idea that Neandertals are "just plain people" (Morris and Parker 1982). Note, though, that this is not quite what the quote says. Anyone who has travelled the Big Apple's subway will probably agree that Neandertals could look quite odd and still meet Straus and Cave's rather lax criterion. Gish (1985) distorts this quote by claiming that a Neandertal in a business suit could walk down a city street and not attract more attention than any other individual, a statement that is probably false.

Johanson and Edey (1981) extend this example by saying that if you put *Homo erectus* on a subway, "people would probably take a suspicious look at him". Put *Homo habilis* on the subway, and "people would probably move to the other end of the car". Berra (1990) states that "if cleaned up, shaved and dressed in business suits, [Neandertals] could probably pass for television evangelists."

Some creationists, such as Sharp (1997), have claimed that Neandertals have existed in historic times. The most cited example is that of a Neandertal reputedly found with (or sometimes in) a suit of chain mail armor (Nature, Apr 23 1908, 77:587), but Sharp also mentions a report of a living Neandertal-like human found in the Phillippines (Nature, Dec 8 1910, 85:176). Both of these reports are so short, a single paragraph, that Sharp quotes them in their entirety. The problem with these claims is that they were made at a time when Neandertals were not nearly as well known as they are today, and by authors who probably had no personal familiarity with Neandertal fossils. There was a tendency in the early 1900's to classify any skull with a browridge or receding forehead as a Neandertal (Trinkaus and Howells, Sci.Am, Dec 1979). This tendency is perfectly illustrated in the report on the "chain mail Neandertal", which mentioned that another scientist had recently classified Australian aborigines as Neandertals. Needless to say, any such claim would be considered ridiculous today. Such old reports, non-peer-reviewed and unsupported by any recent or even contemporary documentation, are equally worthless as evidence of recent Neandertals.

The following quote from Trinkaus and Shipman (1992) refutes claims that Neandertals differ no more from modern humans than living races do from each other:

> "Rare individuals among modern humans may share one, or even a few, of the anatomical characteristics of Neandertals, but not one human - much less any population - can be found that possesses the entire constellation of traits that define Neandertals" (p 412).

Images of Neandertals, a look at attempts to depict Neandertals.

Neanderthal or Neandertal: how should it be spelt?

Neandertal injuries

Creationist Arguments: Anomalous Fossils

A common creationist claim is that humans existed alongside or predated all of their presumed ancestors in the fossil record. Taylor (1992) contains a long list of supposed examples, and Bowden (1981) discusses a number of them in more detail.

Many of these cases are hominid fossils which appear in the correct position in the fossil record. Some of these have already been mentioned: Petralona, ER 1470, the Turkana Boy, and the Krapina specimens. Other examples are:

Laetoli footprints: according to creationists, these are modern human footprints that are dated at 3.7 million years ago, long before humans were meant to exist. Creationists emphasize the close resemblance between these and modern human footprints, but often neglect to mention their extremely small size and the fact they may also be similar to the feet of the australopithecines living at the same time. Exactly how similar they are is a matter of debate.

Tuttle (1990) thinks the footprints are too human-like to belong to *A. afarensis*, and suggests they may belong to another species of australopithecine, or an early species of *Homo*. Johanson, who has often said that Lucy was fully adapted to a modern style of bipedality, claims (Johanson and Edgar 1996) that the *A. afarensis* foot bones found at Hadar, when scaled down to an individual of Lucy's size, fit the prints perfectly. Stern and Susman (1983), who have argued that Lucy's foot and locomotion were not yet fully human-like, believe that the footprints show subtle differences from human prints and could have been made by *afarensis*.

In short, there is a wide range of opinions about the nature of the footprints and whether *A. afarensis* could have made them. Creationists usually cite only Tuttle, whose conclusions they find most convenient. The most honest conclusion, for now, is to admit that no-one can be entirely sure what made the Laetoli footprints.

KP 271: Lubenow (1992) states that this lower humerus is indistinguishable from a human bone, Parker and Morris (1982) state that it is a human bone. Lubenow quotes a number of scientists who state that KP 271 is very humanlike. He does not quote from Feldesman (1982), who found that KP 271, "far from being more 'human-like' than *Australopithecus*, clearly associates with the hyperrobust Australopithecines from Lake Turkana".

KP 271 has usually been assigned to the australopithecines (and recently to *A. anamensis*) because no other hominids are known from 4 million years ago.

Although Lubenow considers this conclusion "shocking", there are plausible reasons for it. The lower humerus of chimps is very similar to that of humans, and it is reasonable to suppose that australopithecines would be even more similar, especially since the upper end of the humerus in australopithecines *is* known to fall within the human range. Patterson and Howells (1967) state that *both* KP 271 and an australopithecine upper humerus were, based on their measurements, virtually identical to some modern humans, yet Lubenow is able to conclude that KP 271 is "*strikingly* close" [his italics] to modern humans, while the upper humerus is only "quite similar, based on visual assessment".

Lubenow's claim that the lower humerus is "relatively easy to discriminate between humans and other primates" is incorrect. Patterson and Howells say that "it is difficult to identify family from only the distal end of the hominoid humerus". Most of the measurements they used had considerable overlap between humans and chimps. Because of this, they were forced to use multivariate analysis, but even this advanced statistical technique was not able to completely distinguish human and chimp populations. Because the lower humerus is a poor diagnostic indicator, it was premature to claim that KP 271 can not be an australopithecine fossil.

The claim that KP 271 was human has been one of the stronger creationist arguments because, although it had not been proven, neither was it demonstrably wrong (unlike almost every other creationist argument about human evolution). However a recent paper now strongly indicates that KP 271 is an australopithecine and not a human fossil.

Lague and Jungers (1996) conducted an extensive study of the lower humeri of apes, humans, and hominid fossils. They used multivariate analysis, a technique which is highly praised by creationists when it delivers results

favorable to them. Lague and Jungers' results show convincingly that KP 271 lies well outside the range of human specimens. Instead, it clusters with a group of other hominid fossils so strongly that the probability that it belongs to the human sample, rather than fossil hominid group, is less than one thousandth (0.001). They conclude:

> "The specimen is therefore reasonably attributable to *A. anamensis* (Leakey et al. 1995), although the results of this study indicate that the Kanapoi specimen is not much more "human-like" than any of the other autralopithecine fossils, despite prior conclusions to the contrary" (Lague and Jungers 1996)

Swanscombe Man: two cranium fragments discovered in 1935 and 1936 by Alvan Marston in England, and a third fragment, discovered in 1955, which fit with the earlier ones. The bones are very thick, with a mixture of primitive and modern features, and an estimated brain size of 1325 cc. They are probably from an archaic *Homo sapiens*, a view compatible with their estimated age of 200,000 to 300,000 years. (Day 1986)

Fontechevade Man: a skullcap fragment which is difficult to classify, and whose dating is doubtful, it is probably also an archaic *H. sapiens*.

Vertesszollos Man: a few tooth fragments and part of an adult cranium found in Hungary. The cranial fragment is very thick and broad, with a mixture of modern and primitive features. This is also considered to be probably an archaic *sapiens*. This would match its age, which has variously been estimated to be from 160,000 to over 350,000 years. (Day 1986)

Olmo Skull: a modern skullcap discovered in 1883 at Olmo in Italy. Later tests gave an age consistent with this of between 50 and 75 thousand years. (Conrad 1982)

Of the other "anomalous" hominid fossils, most are of fossil humans that have since been discovered to be intrusions, i.e. they have been buried in deposits that are older than they are. Examples are:

Abbeville, or Moulin Quignon, Jaw: discovered by Jacques Boucher de Perthes in 1863 at Abbeville in France. This was a modern-looking jaw that had come from very old deposits. However because of strong evidence that it was a modern jaw that had been "planted", probably by de Perthes' workmen, who were paid for good finds, few scientists have ever accepted it as genuine. (Trinkaus and Shipman 1992)

Oldoway Man: a complete skeleton found by Hans Reck at Olduvai Gorge in 1913. In 1932 it was shown to be a modern *Homo sapiens*, buried 20,000 years ago in older deposits that had been exposed by faulting (Johanson and Shreeve 1989). Taylor (1992) writes "Some have suggested this skeleton is an intrusive burial", when in fact this explanation has been unanimously accepted (even by Reck and the notoriously stubborn Louis Leakey). Bowden (1981) disputes this, as Reck had originally claimed the skeleton could not be an intrusive burial because of the undisturbed layers above it. It was later shown, however, that the layer above the skeleton had been misidentified by Reck, and instead of being very old, had been laid down recently, after the skeleton had been buried (Morell 1995). The completeness of the skeleton and its contracted position were also consistent with a burial rather than a natural fossilization.

Kanjera Man, Kanam Jaw: discovered by Louis Leakey near Lake Victoria in 1932, and claimed by him to be very old. The dating however proved to be uncertain, and both are probably modern bones. (Johanson and Shreeve 1989; Lewin 1987)

Castenedolo Man: Morris and Parker (1982) say "Fossils of ordinary people in Mid-Tertiary rock [i.e. tens of millions of years old; the actual date is about 1.5 million years] were found in Castenedolo, Italy back in the late 1800's ...". An official report on these skeletons in 1899 noted that all the fossils from the deposit were impregnated with salt, except the human ones. This implies that they are from relatively recent burials. Collagen tests in 1965 and radiocarbon dating in 1969 confirmed this. (Conrad 1982)

Guadeloupe Man: W. Cooper claimed in 1983 that a modern skeleton found on Guadeloupe in 1812 had been dated at 25 million years old, in the Miocene period. The excellent condition of the skeleton, and the fact that it had originally been found with other skeletons (all pointing in the same direction) along with a dog and some implements, indicate that it was a recent burial. In addition, it has never been claimed to be from Miocene deposits by anyone except Cooper. (Howgate and Lewis 1984)

Galley Hill Man: this was a modern-looking skeleton discovered in 1888 in old deposits. Even last century, many thought it was a modern human, and this was confirmed in 1948 when it was fluorine dated (Trinkaus and Shipman 1992).

Calaveras Man: this was a modern skull discovered in 1866 in California in Pliocene deposits (2 to 5 million years old). A few scientists did believe it genuine, but it was always widely considered to be a hoax. Personal testimonies and geological evidence indicate that it is probably a modern Indian found in nearby limestone caves, and that it was planted as a practical joke by miners. Tests have shown it to be recent, probably less than 1000 years old. (Dexter 1986; Taylor et al. 1992; Conrad 1982)

Meister Man: this was a rock, discovered in 1968 by creationist William Meister, which showed the outline or a shoe or sandal with a trilobite embedded in it. According to mainstream geology, trilobites went extinct long before man appeared. The print showed none of the criteria by which genuine prints can be recognized, and the approximate footlike shape can be explained by normal geological processes. (Strahler 1987, see also Glen Kuban's article on The Meister Print)

Moab Man: two partial skeletons were found in 1971 near Moab in Utah. Creationists have claimed that they were found in a Mesozoic (over 65 million years old) rock formation, but testimony from the anthropologist who helped excavate them shows that they were in loose sand, and partly decayed and not at all fossilized. He thought that they were probably Indian bones of recent origin, and they have since been dated at 200 to 300 years old. The skeletons were later bought by creationist Carl Baugh, who named them as a new species, Humanus Bauanthropus. (Strahler 1987)

Freiburg Skull: Whitcomb and Morris (1961) claim that a skull stored at Freiburg in Germany is far older than evolutionary theory would allow. Creationist Wayne Frair has shown it to be a fake, molded out of pieces of brown coal (Frair 1993).

Paluxy River: it has been widely claimed by creationists that fossil human footprints have been found alongside dinosaur footprints at the Paluxy River near Glen Rose, Texas. Parker (1982), for example, claimed that they "are much more obviously human" than the Laetoli footprints. Scientists showed that many of them were indistinct or infilled dinosaur prints. Some other supposed footprints are either erosional features or, in a few cases (such as the Burdick footprint (Whitcomb and Morris 1961)), carvings. In 1984 the dinosaurian origin of many of the "better" prints was dramatically confirmed when Glen Kuban and Ron Hastings found color markings which preserved the outline of three-toed dinosaur feet. Although there have been some insinuations that these markings could be artificial stains, core samples show that they were caused by an infilling of secondary sediment into the prints. This evidence has caused most creationists to abandon the Paluxy footprints, although claims about them continue to circulate. For further details read Kuban (1996), or Strahler (1987). (See also Kuban's web site on the Paluxy River controversy at http://www.talkorigins.org/faqs/paluxy.html.)

Henry Morris has claimed (1974) that since 10,000 year old *Homo erectus* skulls were found at Kow Swamp in Australia, *erectus* cannot be the ancestor of modern man. The logic is faulty, since there is no reason that a population of *erectus* could not have survived long after *Homo sapiens* first appeared. Morris also has his facts wrong. Characteristics of the Kow Swamp skulls led to suggestions that some *Homo erectus* _features_ had survived in them, as the quote Morris gives from Thorne and Macumber (1972) clearly states. Morris' claim that they are *erectus* _skulls_ is incorrect. It is now thought that the most prominent such primitive feature, flattened foreheads, may have been caused by the cultural practice of head-binding (Day 1986; Gamble 1993).

Lubenow (1992) argues that the Kow Swamp skulls (and some other similar Australian skulls) are very similar to *H. erectus* and should be classified as that species, and that the pathological or cultural causes suggested for their unusual shape could equally well be applied to explain the features of *H. erectus* skulls. Lubenow gives a list of 16 diagnostic characteristics of *H. erectus* and claims that the Kow Swamp skulls fit them well. Peter Brown (pers.comm., 1996) disagrees strongly and shows that the Kow Swamp skulls differ markedly from *H. erectus*, and that Lubenow's characteristics do not apply to them (Brown is an Australian paleoanthropologist who has studied the skulls). Kennedy (1984) shows that the femurs of the Kow skeletons are identical to those of modern humans, and significantly distinct from those of those of *H. erectus*. Other scientists would also dispute that the Kow Swamp skulls are *H. erectus*:

> "There is no doubt that all the people who have ever lived on the continent [Australia] would qualify as anatomically modern humans" (Gamble 1993)
>
> "Analysis of these skeletons has shown conclusively that all are of modern humans, *Homo sapiens*

> *sapiens*." (Burenhult 1993)

Scientists now generally accept that the Kow Swamp skulls were artifically deformed. This conclusion is based on the work of Brown (1981), who performed comparisons of normal and deformed Melanesian skulls. The Kow Swamp skulls show the same signs of deformation that are found in the Melanesian skulls, and these signs are not found in *Homo erectus*. Most obviously, cranial deformation causes a very high cranial vault, whereas *H. erectus* has a very low cranial vault.

The "Stone Circle" at Olduvai Gorge: Gish (1985) says:

> "Extremely startling, and a fact very difficult for evolutionists to assimilate, was Louis Leakey's claim that he had found the remains of a circular stone habitation hut at the bottom of Bed I. Deliberate manufacture of such shelters has long been attributed only to *Homo sapiens*, and can be observed in Africa today."

Gish then asks how australopithecines can be the ancestor of *habilis*, or *habilis* of *erectus*, if they are all found together? And how could *erectus* be the ancestor of modern man, if traces of modern man are found below it?

There are a number of errors in this reasoning. First, the australopithecines in question are robust, and have never been considered ancestors of *Homo*. Even if they were, there is no reason why an ancestor can not coexist with a descendant species.

Secondly, there is no evidence that the stone circle was a hut, or that it was so advanced that it could only be attributed only to *H. sapiens*, as claimed by Gish. Louis Leakey claimed that it may have been no more than a windbreak, and so rudimentary that he saw no difficulty in believing that *H. habilis* could have made it:

> "The recent discovery of a rough circle of loosely piled stones on the living floor at site D.K. I, in the lower part of Bed I, is noteworthy. ... It seems that the early hominids of this period were capable of making rough shelters or windbreaks, and it is likely that *Homo habilis* may have been responsible." (Leakey et al. 1964)

Thirdly, most scientists now agree that the circle is not an artifact. It is only a rough arrangement, and could have just as easily have been formed by water or other natural forces. (Johanson and Shreeve 1989; Tattersall 1993)

The Calaveras Skull Revisited, by Paul Heinrich

Kow Swamp, by Peter Brown

Early Man Fossils: KP 271 (creationist article on KP 271)

The "Meister Print", by Glen Kuban

Kow Swamp: is it *Homo erectus?*

Here is what creationist Marvin Lubenow says about some Australian fossil skulls such as Kow Swamp, Mossgiel, Cohuna, Talgai, and WLH-50:

> While evolutionists have not yet developed a formal definition for *Homo erectus*, a suite of characteristics is generally accepted:
>
> 1. Skull low, broad, and elongated.
> 2. Cranial capacity 750-1250
> 3. Median sagittal ridge
> 4. Supraorbital ridges
> 5. Postorbital constriction
> 6. Receding frontal contour
> 7. Occiptal bun or torus
> 8. Nuchal area extended for muscle attachment
> 9. Cranial wall unusually thick overall
> 10. Brain case narrower than the zygomatic arch
> 11. Heavy facial architecture
> 12. Alveolar (maxilla) prognathism
> 13. Large jaw, wide ramus
> 14. No chin (mentum)
> 15. Teeth generally large
> 16. Post-cranial bones heavy and thick
>
> Where there is material for comparison, the Kow Swamp fossils, as well as the other robust Australian fossils, fit the above description well -- allowing for reasonable genetic variation. They qualify as *Homo erectus*, as the evolutionist uses the term. (Lubenow, 1992)

I asked Dr. Peter Brown to comment on this claim that the robust Aboriginal fossils should be classified as *Homo erectus*. Brown is an Australian paleoanthropologist, and one of the few people who has worked with the Kow Swamp skulls and other Australian fossils. Here is Brown's response (lightly modified to include information from my follow-up queries).

Dear Jim,

I have not bothered to discuss the issue of whether *H. erectus* are deformed or not as from a biological perspective it is so obvious that they are not. For example while the Kow Swamp, Coobool and Nacurrie crania have flattened frontal bones the cranial vaults are high (unlike *H. erectus*), particularly those which are deformed (basion not preserved at Kow Swamp but mean basion-bregma at Coobool 141 mm, range 134-153). Curvature of the parietals (particularly those which are deformed) is MUCH greater than *H. erectus* and the occipitals are of modern Aboriginal morphology and not sharply angled at the torus like in *H. erectus*. Maximum cranial breadth is found high on the parietals, supraorbital region is NOTHING like *H. erectus*, particularly laterally, bone in the basal part of the vault is not thickened, etc, etc. All of the features which distinguish modern Aboriginal crania from *H. erectus* work with terminal Pleistocene Australian crania as well. Just happens that late Pleistocene Australians were about 8% larger and more robust than their contemporaries and a few of them had their heads deformed.

As to the characters in Lubenow's list:

> 1. Skull low, broad, and elongated.

The KS, Coobool and Nacurrie crania are not low. The deformed crania are very high (very unlike *H. erectus*) and the rest fall within the modern Aboriginal range.

> 2. Cranial capacity 750-1250

Endocranial volume for WL50 is about 1500 ml (big vault, but pathological) and Coobool Creek mean is 1404 for males (modern Aborigines 1271).

3. Median sagittal ridge

Median sagittal ridge fairly common in modern males throughout Australia (and Asia as well), rare in females. Not diagnostic of *H. erectus*.

4. Supraorbital ridges

Moderate supraorbital development. True torus VERY rare. Nothing at all like *H. erectus*.

5. Postorbital constriction

Yes, but this is simply a function of a VERY large masticatory apparatus, well developed temporal muscles and a diet which traditionally required lots of chewing, and the long head shape of Aborigines lends itself to greater postorbital constriction. Importantly postorbital constriction at Kow Swamp not outside the range of recent prehistoric Aborigines, but less than in *H. erectus*.

6. Receding frontal contour

Aboriginal crania have a more receding frontal contour than Europeans. Not greater at Kow Swamp or Coobool except in deformed crania, some of which have a MUCH flatter frontal bone than in *Homo erectus* as do artificially deformed Native American crania. But flat frontal bones are not the same as a receding cranial profile. The clearest sign of deformation is the flattened frontal bone on a very high vault with minimal curvature in the occipital region. *H. erectus* crania have a long low vault with a sharply angled occipital at the occipital torus. [See Brown 1981]

7. Occiptal bun or torus

Occipital torus common in males but the morphology of the occipital region is nothing like *H. erectus*.

8. Nuchal area extended for muscle attachment

Prehistoric Aborigines had a large area of neck muscle attachment comparable to hunter gatherers in other parts of the world, but not extended as in *H. erectus*. Quite petite at Kow Swamp: KS5 had a small area of neck muscle attachment, KS1 had more but the occipital is incomplete. All of the Kow Swamp skulls are relatively large, so they have correspondingly large areas of muscle attachment but they all fall within the range of recent prehistoric Aborigines in this respect.

9. Cranial wall unusually thick overall

Cranial vault wall is thickened but the pattern is not like that in *H. erectus*. See my article on vault thickness in the Pithecanthropus volume (J.L.Franzen (ed) 1994. 100 years of Pithecanthropus. The *Homo erectus* problem. Courier Forschunginstitut Senckenberg 171)

10. Brain case narrower than the zygomatic arch

Brain case is normally narrower than zygomatic arch but this is to be expected in a dolicochephalic vault with a well developed masticatory system. *Homo erectus* crania all have long and low vault, with relatively great breadth across the zygomatic arch and marked postorbital constriction. No modern humans, or their ancestors in the last 20,000 years, approach the *H. erectus* condition.

11. Heavy facial architecture

Facial architecture is not what I would describe as heavy. Big palates, big teeth and reasonable supraorbital development but mid face (zygomatics) are delicate in Aboriginal crania. VERY marked contrast to *H. erectus* crania like Sangiran 17.

12. Alveolar (maxilla) prognathism

Big teeth, big palates, prognathic faces. The general evolutionary trend has been for a reduction in masticatory system architecture over the last 100,000 years. This trend continued until around 6,000 years ago.There are arguments about the degree to which this is linked to technological change and food preparation. In some parts of the world this trend appears to have proceeded more slowly. This may be because the hunter gatherer masticatory environment maintained strong selection for large teeth. It is hard to find absolute differences between the teeth of terminal Pleistocene Aborigines and *Homo erectus* but the most obvious one is in the molar size sequence. In *H. erectus* the smallest molar is usually the first, next largest the 2nd and largest the third. In Aborigines the largest molar is usually the second. In Europeans and east Asians the largest molar is usually the first.

13. Large jaw, wide ramus

Large mandible due to large teeth. *H.erectus* has a broad ramus while all Aborigines, including Kow Swamp, are

narrow.

14. No chin (mentum)

Most aboriginal mandibles have a chin but it is not as prominent as in Europeans. This is what you would expect with larger teeth and greater alveolar development.

15. Teeth generally large

Teeth large, particularly molars, but tooth size pattern not like *H. erectus*. Largest molar normally M2, followed by M1 and M3. In *erectus*, M1 is smallest, M3 largest.

16. Post-cranial bones heavy and thick

Postcranial bones are not heavy and thick. Lightly built tropical hunter/gatherers. Postcranial skeletons not as robust as urban Europeans or Asians, let alone Homo erectus.

Hope this helps.

Best wishes, Peter.

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In summary, the Kow Swamp and other robust Australian skulls do *not* fit the definition of *Homo erectus*

They do have a fairly receding forehead (6), but this is caused by cranial deformation; there are clear signs of deformation in these skulls which are not found in *H. erectus* (Brown 1981). In a few characteristics correlated with their larger teeth (5, 10, 12, 14, 15), the Kow Swamp skulls resemble *H. erectus* more than most other modern humans, but are still are generally outside the *H. erectus* range. But most of Lubenow's criteria for *H. erectus* do not fit the Australian skulls at all well (1, 2, 4, 7, 8, 9, 11, 13, 16).

References

Brown P. (1981): Artificial cranial deformation: a component in the variation in pleistocene Australian aboriginal crania. Archaeology in Oceania, 16:156-67.

Lubenow M.L. (1992): Bones of contention: a creationist assessment of human fossils, Grand Rapids,MI:Baker Books.

Australian Palaeoanthropology, by Peter Brown

Kow Swamp, by Peter Brown

Artificial Cranial Deformation, by Patricia Lindsell

Kow Swamp: is it Homo erectus? a counterpoint, by Jim vanHollebeke

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Creationist Arguments: Brain Sizes

Brain sizes(*) vary considerably within any species, but this variation is not usually related to intelligence. Instead, it correlates loosely with body size: large people tend to have larger brains. As a result, women on average will have smaller brains than men, and Pygmies will have smaller brains than Zulus, but the average intelligence of all these groups is, as far as we can tell, the same.

(*) Note: for convenience, I use the term "brain size" instead of "cranial capacity". Because the brain does not fill the cranial cavity, the brain size is smaller than the cranial capacity, but the latter value is, obviously, the only one that can be determined from a skull.

Figures for the average brain size of modern humans tend to vary between sources, but a typical value is 1350 or 1400 cc (cubic centimetres). The following figures should convey a feel for the normal range of variation in human skulls. Burenhult (1993) states that the 90% of humans fit in the range 1040-1595 cc, and that the extreme range is 900-2000 cc. S.J. Gould, in "The Mismeasure of Man", reviewed a 19th century study by Morton of 600 skulls which ranged from 950 to 1870 cc (and 25% of this sample was of small-statured Peruvians, so the figure of 950 cc is, if anything, lower than it might be for 600 randomly selected humans). Morton also catalogued his skulls by race, with the lowest average for any racial group being 1230 cc.

Hrdlicka (1939) examined the extremes of brain size in the 12,000 American skulls stored in the U.S. National Museum collections. Of these, the smallest 29, or fewer than 1 in 400, ranged from 910 to 1050 cc. Hrdlicka states that the smallest skull in this collection, at 910 cc, appears to be the lowest volume ever measured for a normal human cranium. The low volume skulls were not primitive or aberrant in any way; their small volume was merely a result of the smallness of the entire skull.

Various sources, some of them creationist, give lower limits for human brain size of 900 or 830 cc. The prominent British anatomist Sir Arthur Keith in 1948 gave 855 cc as the lowest known human brain volume (compared with 650 cc as the then highest known brain volume for a gorilla). Normal humans with even smaller brains have been found, but they are very rare. Microcephalics, who are subnormal in intelligence, can be as low as 600 cc, but this is a pathological condition and such skulls cannot be considered normal.

Compare the above figures with the 5 measurable Java Man skulls. These *average* 930 cc, less than the minimum of the 600 modern skulls cited above, with the smallest being 815 cc. Moreover, unlike modern humans with low brain sizes, these skulls are very robust, with flattened braincases and large brow ridges.

These figures also show how extraordinary the Turkana Boy is. As an adult, he would have been around 183 cm (6'0") tall, large even by modern standards. Modern men of that stature would be expected to have a larger than average brain size, but the Turkana Boy's estimated adult brain size of 910 cc is smaller than all but a fraction of 1% of modern humans of all sizes and both sexes. For comparison, 900 cc is a typical brain size for a modern child of 3 or 4 years weighing 15 kg (33 lbs).

Lubenow (1992) states that the lower limit of human cranial capacity is 700 cc, a much lower figure than anyone else. His source is "Races, Types and Ethnic Groups" by Stephen Molnar. Molnar says that "there are many persons with 700 to 800 cubic centimeters", but provides no source for this information, and none of his sources appear to do so either. In fact, one of his sources contradicts Molnar (and Lubenow). Tobias (1970) says that according to Dart, "apparently normal human beings have existed with brain-sizes in the 700's and 800's" (maybe Molnar's claim is a mis-statement of this), and that the smallest cranial capacity *ever* documented is 790 cc.

This strongly contradicts Molnar's claim that "many" modern humans have a cranial capacity below 800 cc, and Lubenow's derived claim that anything above 700 cc is a "normal" value. Instead, it appears from a variety of sources that values below 900 cc are very rare, and values below 800 cc virtually nonexistent.

Even if exceptional humans were found as low as 700 cc, it would still be implausible for Lubenow to claim that ER 1470, at 750-775 cc, is "well within the normal human range". (One might equally validly claim that an adult height of 122 cm (4'0") is well within the normal range on the grounds that some people are only 107 cm (3'6") tall.) Such cases, if they even occur, are obviously exceptionally rare, and the probability of finding a fossil human skull with such a small brain is essentially zero. It is far more probable that 1470 was a fairly typical member of its population. This is what we find: other *habilis* fossils, very similar to 1470, are even smaller, and well below Lubenow's lower limit of 700 cc.

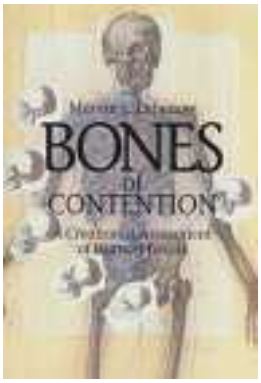
Chimpanzees have a brain size between 300 and 500 cc, with an average of 400 cc. Gorillas have an average brain

size of 500 cc, with large individuals going up to 700 cc, or even 752 cc in one instance. Hominids are best compared with the similar-sized chimpanzees than the much larger gorillas.

Lubenow states that "the crucial element is not brain size but brain organization. A large gorilla brain is no closer to the human condition than is a small gorilla brain". Lubenow's point is correct. If evolution is true, transitional creatures with brain sizes between 650 and 800 cc must have existed, but finding a skull with such a brain size does not prove that its owner was a transitional form. To be a convincing transitional form, a skull should not only have an intermediate brain size, but also an intermediate morphology.

This is exactly what is found in some *H. habilis* fossils. While there are no habiline fossils for which both brain and body size can be measured, it is fairly clear that they were smaller than humans, and many times smaller than male gorillas, the only apes with comparable brain sizes. Nor do *H. habilis* skulls have the crests and bone ridges found in large ape skulls. In addition, the insides of their skulls show many modern features (Tobias 1987). They are both larger and more modern, internally and externally, than the skull of any comparably sized ape.

Between species, average brain size, when a corrective formula for body size is applied, is a fair indicator of relative intelligence. The results are approximate, because they depend on which formula is used, and also on brain and body size, both of which are difficult to estimate for most fossil hominids. However it seems australopithecines were roughly as smart as, or probably a bit smarter than, chimps. *Homo habilis* and *erectus* were intermediate between chimps and modern humans. Walker and Leakey (1993) and Tobias (1987) have good overviews of attempts to estimate the relative intelligence of hominid species.



Creationist Arguments: Bones of Contention

The major argument of Marvin Lubenow's book "Bones of Contention" (1992) is that the various species of hominid cannot form an evolutionary sequence because they overlap one another in time.

Firstly, he argues that a species cannot survive once it has given rise to a new species. Unlike other creationists, he does attempt to give some justification for this. Supposedly, the newer, fitter descendant species, would, because of its superiority, drive its parent species to extinction. The argument is incorrect because members of the parent species may live in a separate region from the new species. If the species come into contact again, there may be no competition because they have diverged enough to occupy different ecological niches. (Many scientists would argue that even the requirement for a separate region is unnecessary.) Additionally, it is a misunderstanding of evolutionary theory to claim that a new species is "superior", in some absolute sense, to its parent species. Typically, both species will be "superior" at living in their own niches.

This argument is so broad that it would not only disprove human evolution but all evolution; Lubenow is basically asserting that a species cannot split into two species. Obviously this is not the view of speciation accepted by evolutionists, since it would follow that the number of living species could never increase.

The argument is also contradicted by real world examples, such as that of the 13 species of finch which live on the Galapagos Islands. There is such compelling evidence that these are descended from a common ancestor that even most creationists accept them as evidence of evolution "within a created kind". If Lubenow was correct, even such micro-evolution would be impossible. By his argument, newly-evolved finch species should drive their ancestors to extinction. This does not happen, of course, because they all live on different foods.

Secondly, and more seriously, Lubenow claims that, in some cases, a descendant species existed before the species it supposedly descended from. Clearly, this *is* impossible under evolutionary theory.

For example, Lubenow claims that *Homo erectus* overlaps the entire time range in which *Homo habilis* is found. The oldest dated *habilis* specimen he lists is about 1.9 million years old (with a possibility that another was as much as 2.35 million years old).

Lubenow criticizes Klein (1989) for showing a graph in which *habilis* is shown preceding *erectus* in time, when none of the *habilis* fossils discussed by Klein are dated before 1.9 million years ago. In this case, Lubenow has not read Klein carefully enough. Klein does, on page 133, and in a graph on page 112, mention the presence of *habilis*-like fossils found at about 2.3 million years. These are a few fragmentary teeth attributed to *Homo*, found at Omo in Ethiopia, and dated to 2.3-2.4 million years (Howell et al. 1987). They are relatively unimportant, and it is not surprising that Klein would not give them any further discussion.

But there is no reason to believe that fossils have been found over the entire range of time for which *habilis* existed. Almost all *habilis* fossils have been found in the rich deposits of Olduvai Gorge and Koobi Fora (both less than 2 million years old), while there is a scarcity of fossiliferous regions between 2 and 2.5 million years.

One might expect further fossil finds to extend the time range in which *H. habilis* is known, and that is what has likely happened. Hill et al.(1992) have analyzed a skull bone, KNM-BC 1, found in Kenya in 1967. They

identified it as belong to the genus *Homo* (though not to *erectus* or *sapiens*), and have dated it at 2.4 million years. Schrenk et al.(1993) have announced the discovery in Malawi of a hominid lower jaw, UR 501, that they have attributed to *Homo rudolfensis* (a proposed *habilis*-like species). Faunal correlations suggest it is probably around 2.3 to 2.5 million years old. Kimbel et al.(1996) have reported an upper jaw found in Ethiopia which belongs to the genus *Homo*, is associated with stone tools, and is over 2.3 million years old. And Semaw et al.(1997) have reported stone tools found in Ethiopia and dated at between 2.5 and 2.6 million years old. Since stone tools are not known to have been used by australopithecines, it is most likely that they were made by early *Homo*. In short, there is growing evidence of early *Homo* species which could have been ancestral to *H. erectus*.

Similarly, Lubenow claims that humans are found up to 4.5 million years ago, before any australopithecines. Before 2 million years ago, the evidence for this consists of only two fossils, the Laetoli footprints and the Kanapoi Hominid (KP 271) (since dated at about 4 million years). This is Lubenow's strongest argument, because both fossils are, arguably, from humans. The problem is that there is not enough other evidence to exclude the possibility that both belong to australopithecines. More diagnostic fossils such as skulls, or partial skeletons, could prove the existence of humans, but so far, all such evidence points only to the existence of australopithecines past 3 million years ago.

There are more fossils which Lubenow considers to be *sapiens*, but which are as old as the earliest *erectus* fossils (about 2 million years). These consist of some undoubted *habilis* fossils such as ER 1470, and some fossils usually assigned to *erectus* or *habilis*. These fossils are all of body parts which are difficult to classify, because other *Homo* species are both poorly known, and not that different below the neck, as far as we know, from modern humans. Lubenow admits the difficulty but assigns them to *H. sapiens* anyway.

Lubenow claims that the leg bones ER 1481 (about 1.9 million years old) are "fully modern", but gives no documentation of this. Although ER 1481 is similar to modern humans and belonged to a bipedal creature, there are numerous features in which it differs from *H. sapiens* (McHenry and Corruccini 1976; Aiello and Dean 1990).

Similarly, Lubenow considers that many *H. erectus* fossils occur too early or too late. The "early" fossils are mostly obscure and difficult to identify or date, and Lubenow seems to have chosen dates for them that help his argument. For example, he identifies one of them, the hip bone ER 3228, as 2 million years old, even though he elsewhere quotes from a scientific paper which describes it as "roughly 1.5 m.y. (or greater)". Even if it is 2 million years old, *habilis* is so poorly known below the neck that it is difficult to identify isolated bones.

The "late" fossils are a group of over 100 supposed *Homo erectus* fossils occurring after 300,000 years ago. Many are Australian aboriginals, including over 40 from Kow Swamp, none of which are classified as *Homo erectus* by anyone except Lubenow.

Lubenow continually resorts to the argument that overlaps between species falsify human evolution. Once it is realized that this argument is based on a misunderstanding of evolutionary theory, Lubenow's book loses much of its force.

Creationist Arguments: Semicircular Canals

A number of creationists (Gish 1995; Lubenow 1996; Mehlert 1996; Wieland 1994) have cited studies of the semicircular canals as evidence of a lack of transitional forms leading from apes to humans. These claims are based on the work of Fred Spoor and his colleagues (Spoor et al. 1994; Shipman 1994). The semicircular canals are three small, intricate structures in the inner ear, arranged roughly at right angles to each other, which give us our sense of balance and allow us to orient ourselves. Hoping that their structure might reveal something about hominid evolution, Spoor studied the canals of many living primates, including humans, and compared them with some hominid fossils. Because the canals are so small and buried in a bony part of the skull, it was necessary to use CT (computerized tomography) scanning to examine the canals without destroying the fossils.

Spoor's results were interesting. The canals in *Australopithecus africanus* and *robustus* skulls were most similar to the great apes. Spoor et al. found this consistent with the commonly-held view that australopithecines were partly arboreal and partly bipedal. (They did not conclude that australopithecines were quadrupedal, as most creationists imply or claim.)

The *Homo erectus* skulls all had a very humanlike pattern. This would be expected, since *erectus* was fully adapted to bipedality. Another skull, SK 847, which has been attributed to both *H. erectus* and *H. habilis*, proved to have canals like those of *erectus* and *sapiens*.

Most interesting were the results for Stw 53, which is usually classified as *H. habilis*. The morphology of this skull was unlike both apes or humans, and most closely resembled that of some large monkeys. Spoor et al. suggested that this meant that Stw 53 relied less on bipedality than did the australopithecines. This would argue against Stw 53 being ancestral to humans, which would be consistent with another study done on the partial skeleton OH 62 (Hartwig-Scherer and Martin 1991) which concluded that its limb proportions were more apelike than those of Lucy. However since it is widely thought that more than one species is represented in all the fossils that have been assigned to *habilis*, this result does not necessarily apply to all habilines. Further studies are clearly needed on the other habiline fossils to work out what is going on here.

Interestingly, one of the *Homo erectus* skulls studied was Sangiran 2, found on Java. Gish (1995) points out that Sangiran 2's semicircular canals have modern humanlike proportions, obviously implying that it is merely a modern human. However this partial skull is virtually identical to the original Java Man skullcap, which Gish considers an ape. So not only does Gish classify two very similar skulls as an ape and a human respectively, he classifies the *smaller* one, the 815 cc Sangiran 2, as a human, and the larger 940 cc Java Man skullcap as an ape!

More recently, Hublin et al. (1996) show that the semicircular canals in Neandertals are different from those of modern humans. The significance of this finding is unclear, since there is no doubt that Neandertals were fully bipedal. However it does suggest that Neandertals are not particularly closely related to modern humans, and gives some support to those who believe that they should be considered a separate species, *Homo neanderthalensis*, rather than a subspecies of *Homo sapiens*. It is not a result that can be easily explained by creationists, who have always argued that Neandertals are little more than a racial variant of modern humans. This unexpected result suggests that the link between locomotion and the structure of the semicircular canals is complex and not well understood. Indeed, Graf and Vidal (1996) have argued that there is no relationship between the shape of the semicircular canals and locomotion, although Spoor et al. (1996) dispute this.

While these early results have not shown any clear evidence of transitional types of semicircular canals, neither are they, with the exception of Stw 53, enough out of line with evolutionary expectations to cause much surprise. Moreover some results of these studies are problematic for creationists. The human-like canals of Sangiran 2 are a serious problem for the many creationists who claim Java Man is an ape, while the distinctive canals of Neandertals suggests a greater difference between them and modern humans than most creationists are likely to be happy with.

References

Gish D.T. (1995): Evolution: the fossils still say no! El Cajon, CA: Institute for Creation Research. (an updated

version of Gish 1985)

Graf W. and Vidal P. (1996): Semicircular canal size and upright stance are not interrelated. Journal of Human Evolution, 30:175-81.

Hartwig-Scherer S. and Martin R.D. (1991): Was "Lucy" more human than her "child"? Observations on early hominid postcranial skeletons. Journal of Human Evolution, 21:439-49. (a comparison of Lucy and OH 62)

Hublin J., Spoor F., Braun M., Zonneveld F., and Condemi S. (1996): A late neanderthal associated with upper palaeolithic artefacts. Nature, 381:224-6.

Lubenow M.L. (1996): Palaeoanthropology in review. Creation Ex Nihilo Technical Journal, 10:10-7.

Mehlert A.W. (1996): *Australopithecus* and *Homo habilis* - pre-human ancestors? Creation Ex Nihilo Technical Journal, 10:219-40.

Shipman P. (1994): Those ears were made for walking. New Scientist, (July 30, 1994) 143:26-9.

Spoor F., Wood B.A., and Zonneveld F. (1994): Implications of early hominid labyrinthine morphology for evolution of human bipedal locomotion. Nature, 369:645-8.

Spoor F., Wood B.A., and Zonneveld F. (1996): Evidence for a link between human semicircular canal size and bipedal behaviour. Journal of Human Evolution, 30:183-7.

Wieland C. (1994): New evidence: only people ever walked really upright. Creation Ex Nihilo Technical Journal, 8:127-8.

Offsite: Standing (and Walking) Alone: The Vestibular System and Its Role in Theories of Human Evolution, by John Woodmorappe (creationist article)

Offsite: Commentary on the Arcy-sur-Cure Neandertal

Creationist Arguments: Overview

When one reads creationist literature about the human fossil record, there is a definite pattern in the fossils that are selected for discussion.

Huse (1983), in a summary of "some of the more significant so-called fossil ape-men", discusses the insignificant Nebraska Man, Piltdown Man, Lucy, the Neandertals, and the original Java Man fossil, ignoring all other *H. erectus* fossils, *H. habilis*, and *A. africanus*.

Taylor (1992), ("Each of the most famous 'missing links' is discussed") devotes only two sentences to *H. habilis*, mentioning no fossils by name and dismissing it as an ape. Taylor also makes misleading use of the past tense to imply that even evolutionists no longer accept habilis as a transitional form - an implication which is totally incorrect. Of *H. erectus*, only Peking Man and the original Java Man fossil are mentioned in the main text.

Parker (Morris and Parker 1982) claims that "all the candidates once proposed as our evolutionary ancestors have been knocked off the list", and then proceeds to give the list, which is inexplicably lacking *H. erectus* (it is lumped in with Java Man) and *H. habilis*, and the gracile australopithecines. (Parker then contradicts himself by admitting that the gracile australopithecines are still possible candidates.)

Gish (1985) discusses Java Man, Peking Man and ER 1470, but almost totally omits mention of all other *H. habilis* and *H. erectus* fossils.

Bowden (1981) discusses Piltdown Man, Java Man and Peking Man extensively. Unlike most creationists he is at least aware of other *Homo erectus* fossils and the *Homo habilis* fossils from Olduvai Gorge, but they receive only a brief mention.

Lubenow (1992) alone appears to be aware of all the fossil material, and comes closest to addressing the evidence, but he fails to discuss some of the more compelling intermediate fossils such as OH 7, OH 24 and ER 1813 (because his book is about the human fossil record, and he considers most *habilis* specimens to be apes).

Until recently, most creationist literature followed Gish in claiming that the Java Man and Peking Man fossils were of apes. Since Lubenow's book was published in 1992, some creationists have backed away from this absurd and untenable position, but Gish (1995) has not. If he eventually does so, it looks as though his strategy will be to blame Boule and Vallois for his own incompetence:

> "... the Asian *H. erectus* fossils were apparently very different in many respects [from modern humans], if Boule and Vallois and others are correct in their assessment of these creatures." (p.301) (Gish 1995)

Boule and Vallois made very clear that both Java and Peking Man were intermediate in form between apes and humans, and Gish was only able to make it appear otherwise by badly misrepresenting them.

Creationists appear to avoid discussion of the fossils that are the best evidence for human evolution. These include superb fossils such as ER 3733 and Sangiran 17 (human but with primitive features), Sts 5 (apelike, but with some modern features) and OH 7, OH 13, OH 24, and ER 1813 (so perfectly transitional that they are difficult to classify).

In contrast to the above omissions, it is almost impossible to find a creationist work that does not mention Nebraska Man (Lubenow is the one exception), despite the fact that it was at best weak evidence for human evolution even during its brief heyday 70 years ago, and Piltdown Man, despite the fact that the hoax was discovered over 40 years ago. Ramapithecus, which was often claimed to be a human ancestor in the 1960's and 70's, also gets mentioned frequently.

Some transitional fossils are often mentioned in creationist literature, typically Java Man and Peking Man, and sometimes ER 1470. This is probably because most creationists, knowing little about the fossils and copying their information from other creationist sources, are under the mistaken impression that these fossils have been shown to be either ape or fully human. When creationists do perform their own evaluations, they show a surprising inability to agree on which fossils are apes and which are humans, exactly what one would expect if evolution had occurred intermediates existed.

Even more surprisingly, creationists do almost no anatomical comparisons, even of the fossils they do discuss. (Virtually the only exception is Mehlert (1996), who I hope to address in the future.) Typically, they will flatly assert that a fossil is a human or an ape. Rarely do they provide photographs, so that their readers could judge for themselves whether the fossils are transitional or not. If, as many of them claim, Java Man is an ape, a comparative photo of an ape, Java Man and a human would be an easy way to demonstrate it. If they are confident in their interpretation of the data, why do they not show the evidence to their readers?

Another feature of creationist literature is its approach to scientific authority. Creationists appear to make no attempt to weigh evidence; they often accept uncritically any statement made by a scientist which can be used to advantage, while ignoring any contrary opinions. Scientists used in this way include Oxnard, Zuckerman, and Ivanhoe. Their results are often treated as if they were authoritative, when in reality they are very much minority opinions in the scientific community.

Creationists fail to see evidence of transitional forms not because there is none, but because they have a infallible method of explaining away any evidence. Starting with the certainty that transitional fossils do not exist, any fossil that is too different from *H. sapiens* to be considered a human is an ape, and all others are humans. No creationist ever defines what would be acceptable as a valid transitional fossil, because examples could be found to fit any reasonable definition. Instead, creationists are forced to take potshots at irrelevant fossils, misrepresent a few carefully selected examples, and ignore the strongest evidence for human evolution.

Creationist Resources on Human Evolution

Books

- *God - or Gorilla* (1922), by Alfred McCann. New York: Devin-Adair
- *The Theory of Evolution and the Facts of Science*, 6th ed. (1943), by Harry Rimmer. Grand Rapids, MI: Wm. B. Eerdmans
- *Science of Today and the Problems of Genesis*, 2nd ed. (1969), by Patrick O'Connell. Hawthorne, CA: Christian Book Club
- *Fossil Man*, 2nd ed. (1971), by Frank Cousins. England: Evolution Protest Movement
- *Who killed Adam?* (1978), by Edward Lugenbeal. Nashville, TN: Southern Publishing Association
- *Ape-men: Fact or Fallacy*, 2nd ed. (1981), by Malcolm Bowden. Bromley, Kent: Sovereign
- *Evolution: the Challenge of the Fossil Record* (1985), by Duane Gish. El Cajon, CA: Creation-Life Publishers
- *Bones of Contention* (1992), by Marvin Lubenow. Grand Rapids, MI: Baker Books
- *Evolution: the Fossils still say No!* (1995), by Duane Gish. El Cajon, CA: Institute for Creation Research
- *Skeletons in your Closet* (1998), by Gary Parker. Green Forest, AR: Master Books
- *Buried Alive* (1998), by Jack Cuozzo. Green Forest, AR: Master Books (Review by Colin Groves)

Pamphlets

- *Big Daddy?* (1972), by Jack Chick (Review)
- *Have you been brainwashed?* (1986,1994), by Duane Gish

Videos

- *The Origin of Man* (undated), by Duane Gish
- *Ancient Man: Created or Evolved?* (undated), by Roger Oakland
- *The Image of God* (1997), by Keziah Productions

Non-creationist books

These books are not written by creationists, but are similar to creationist books in their skepticism of the mainstream scientific view of human evolution.

- *The Genesis Mystery* (1983), by Jeffrey Goodman (Review)
- *The Bone Peddlers* (1984), by William Fix
- *Hidden History of the Human Race* (1995), by Cremo and Thompson (Review by Brad Lepper)

Review: Buried Alive

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Buried Alive: The Startling Truth about Neanderthal Man. By **Jack Cuozzo** Green Forest, Arkansas: Master Books. 349pp. ISBN 0-89051-238-8. Reviewed by **Colin Groves.**

Jack Cuozzo is an orthodontist who works in a hospital in New Jersey, trained in forensic anthropology by the noted physical anthropologist W.M.Krogman. He is fascinated by the Neandertal fossils, and has personally examined and X-rayed many of them; this makes him unusual, possibly unique, because he is also a creationist. I know of no other creationist who has even tried to look at original fossil hominids: not Lubenow, not Bowden, certainly not Gish, all of whom snipe away from a position of profound ignorance. But Cuozzo has studied the originals: what difference does it make to his assessment them?

His descriptions and basic assessments of the fossils, informed by his training and his skills in the othodontic field, are almost uniformly excellent, especially in his concluding "Research Notes" section. The way he reconstructed the subadult skull from Le Moustier is a case in point; his slightly patronising surprised tone when he reports (p.300) that the curators are using his radiographs to "put it together correctly" is quite uncalled-for: the curators realised that he very obviously knew what he was doing. In four and a half pages (pp.274-279) he demolishes the notion that the distinctive Neandertal morphology is entirely due to disease, taking apart the three proposed hypotheses - arthritis, syphilis, rickets - one by one; he even chastises a fellow creationist, Lubenow, for getting caught up in the rickets hypothesis. So one is the more astonished to read, in the next page and a half, from this man who has so clearly established that Neandertal morphology is real, that the entire appearance of the Kabwe (Broken Hill, Rhodesian) skull was caused by acromegaly!

Running throughout the book is a rivulet of paranoia. A rivulet, did I say? - an ocean, more like: the entire book is soaked in it, and it even infuses the descriptions of the fossils themselves. The entire first section of the book, fifteen chapters long, is a paean of paranoia: There, in 1979, is our hero, with his wife and five children, travelling to Paris; they breach the defences of the Musée de l'Homme, bastion of evolutionism, hiding their X-rays from the staff lest their true purpose be discovered; they are dogged by a mysterious Mr.McCue in Normandy; a furtive visit to the Louvre is spent dodging a sinister American, doubtless an evolutionist sent to tail them, their suspicions confirmed when he is detected that evening dining in the same pizzeria, after which there is a high-speed car chase through the suburbs of Paris, followed by not one but two cars driven by evolutionists; contact with friends is thwarted because their phone number, copied down by the conniving evolutionist lab secretary in the museum, turns out to be just a phone box; finally it gets so bad that, at the airport hotel, they have to unscrew the bathroom doors of the two rooms they occupy, to wedge them against the doors of their suites lest the evolutionists push their way in. This all reads like the screenplay for an Indiana Jones movie, but there is one little difference - there is *not a scrap of evidence* that anything anything untoward was going on, that any "evolutionist" was the least bit interested in them, let alone giving them wrong phone numbers, following their car, or trying to get into their rooms. (One might, indeed, infer that their own behaviour was more than a little suspicious: what were they doing, in the gastronomic capital of the world, visiting a pizzeria?).

And the paranoia of those first fifteen chapters never goes away. He meets with nothing but helpfulness in European museums, whether in Paris, London, Liège or Berlin, yet he persists in having dark thoughts about evolutionists looking over his shoulder. He finds a fossil that has been incorrectly reconstructed and immediately concludes not that those responsible had been simply mistaken, even a bit incompetent, but that they had been frauds, trying to make the fossil look more ape-like than it should be. Time and again we meet this theme. Take, for example, the Kabwe skull (already mentioned above). Ronald Singer's early (1958) X-ray of it almost seems designed, he implies in Chapter 16, to hide an uncomfortable fact about it - that it has a bullet hole in it! (And so does the photo of it on the dust-jacket of Mellar's and Stringer's (1989) book, *The Human Revolution*). Aha - not an ancient, primitive skull at all, but a modern acromegalic that had been killed by a shot from a gun!

Now, were I as paranoid as Cuozzo, I might at this point accuse him of concealing contrary evidence. Instead, I

will do him the courtesy of suggesting merely that he has overlooked relevant literature. Montgomery et al. (1994) described and discussed that "bullet hole" in some detail, drawing attention to previous published discussions, and identified it is a partly healed pathological lesion.

Later in Chapter 16 Cuozzo implies that Dean, Stringer and Bromage were covertly responding to his (unpublished) findings by publishing a 1986 paper on growth in Neandertals, specifically the Gibraltar II child - and of getting it wrong because they assumed uniformitarianism, and did not allow "the skull and jaws ... to speak for themselves" (p.76). Actually, shortly afterwards Stringer et al. (1990) looked again at Neandertal ageing; using the Spitalfields dental data to assign a probable age to Gibraltar II, and commenting at length on the implications of this for growth in the skull. As before, I choose to interpret Cuozzo's failure to mention this study, which has certain rather profound implications for his own model, as mere ignorance of the literature rather than as a need to suppress information incompatible with creationism.

Then there is the "chin" of the La Quina V skull, apparently depicted in a 1911 excavation photograph reproduced on the cover of the book. On p.42, Cuozzo describes how evolutionists, over time, gradually replaced the chin (a sign of modernity; evolutionists wanted to make it primitive and ape-like, remember) by "a plastic-like material" and made it appear chinless. The fact is that the specimen even when discovered lacked a chin; look at that excavation photo carefully and you will see that the front of the jaw, except for the lowermost margin, consists of a smooth pale substance (plaster?) which was doubtless put there as the excavation progressed to hold the lower teeth in place - the presence of a "chin" then was as much an artifact as its absence is now, though as we know that some Neandertals did have some symphyseal protrusion it does not matter one way or the other and I can't see why Cuozzo gets so excited about it.

And there is the Le Moustier skull. On p.166 of the book is a photo, which he took in the public exhibition section of the museum in Berlin, which purports to be a reconstruction of the skull, and on p.167 is a drawing taken from a colour slide which can be purchased at the museum. Both, says, the author, are fraudulent: the specimen in the exhibition is "very ape-like" (p.165), while on the slide the mandible is dislocated and set much too far forward, so it is being "passed off as evidence for evolution" (p.166). Now, I can find no photo or drawing of Le Moustier anywhere that looks like either of these two. The exhibit appears to be actually a poor reconstruction not of Le Moustier at all but of "Pithecanthropus IV" from Sangiran, Java; presumably the labels got mixed up? As for the slide, it should be remembered that the Le Moustier remains were thought to have been destroyed during the war (until about 1989, when apparently they were returned from the USSR where they'd been all the time), so poorish drawings and casts may have been all that the museum authorities had had to work with. Experience teaches that a stuff-up is usually far more plausible than a conspiracy.

And now, finally, to what Cuozzo deduces to be The Truth about Neandertals: they were all extremely, incredibly old. Using modern standards - itself a little surprising, because of his continual tirades about uniformitarianism - he extrapolates from the infant Pech de l'Azé skull to the late juvenile Le Moustier specimen and through to the adult La Chapelle-aux-Saints and La Ferrassie I skulls, and concludes that Le Moustier was in his 30s at death, while La Chapelle and La Ferrassie were hundreds of years old! And, by Jove, wasn't this exactly the ages that, according to *Genesis*, people were achieving immediately after the Flood? - So that, friends, is who the Neandertals were: they were Arphaxad and co, Shem's descendants.

Actually, how many hundreds of years old *were* La Chapelle and La Ferrassie? You get different answers from different measurements. From near-maturity (Le Moustier's age) into old age, modern human cranial length increases at 0.06mm per year, according to the figures Cuozzo quotes and which I see no reason to doubt; La Ferrassie's cranial length is 16mm greater than Le Moustier's, so this represents 267 years of growth. Total facial height, on the contrary, grows at 0.18mm/yr, giving only 137 years' growth between Le Moustier and La Ferrassie; while lower facial height grows at 0.063mm/yr, giving 278 years' growth; basal skull length grows at 0.052mm/year, giving 365 years' growth; and so on. There is, in other words, variability. Moreover, calculating the growth from Le Moustier to La Chapelle, you find using some measurements that La Chapelle is older than La Ferrassie, but using others that it is younger.

There is a further internal difficulty with this: wouldn't their teeth have worn out completely, long before they reached three hundred years of age? Cuozzo's answer is simply astounding: their enamel regenerated! He quotes papers about the salivary enzyme statherin, which does indeed recalcify enamel in a minor way - but there is absolutely no evidence that it rebuilds teeth and keeps them functioning for hundreds of years. While one can perhaps admire his honesty in recognising that there is a problem, his sheer invention of a solution, out of thin air, does him no credit at all.

Now, I have no quarrel at all with the proposition that Neandertals may have lived to high ages. If one accepts the

arguments of Cutler (1975), their potential longevity was about as great as ours, into the 90s perhaps. But 90 or 95 years is hardly 300 or 400.

Neandertals were consistently different from us, at any age. Infants as well as adults have a whole suite of characters which are distinct from modern humans (Schwartz & Tattersall, 1996). What evidence is there for Cuozzo's (uniformitarian) assumption that their growth from infancy to maturity, and the changes they underwent as adults, were the same as ours? None; in fact, the evidence is to the contrary, as witness the fact that you get different ages for La Ferrassie according to whether you extrapolate rates based on basal length, facial height or whatever (see above). The changes they underwent, both during growth and during adult life, were different from ours, that's all; and if part of this lay in some overall faster rates, so what?

Suppose we test the hypothesis that growth rates vary between species. In my time, I have measured a vast number of skulls of Great Apes. On a data sheet of orangutan skulls from the Berlin Museum I found measurements of a late juvenile male (about equivalent in dental eruption stage to Le Moustier), about 7 years old, and took two adults at random from the same sheet. The basal skull length of the juvenile was 142mm; the two adults were 173 and 183mm. Modern human basal length grows at 0.052mm/yr after the late-juvenile stage; so using Cuozzo's logic the two adult orangutans must have been 596 and 788 years old, respectively (plus the 7 years to reach the age of the juvenile skull). Again, the cranial length of the juvenile was 121mm, the two adults 140 and 135mm (note, by the way, that the adult with the shorter basicranium had the longer neurocranium). Modern human cranial length grows at 0.06mm/yr, so the two adult orangutans were 317 and 233 years old, respectively. Or perhaps not; perhaps different species grow at different rates, eh?

Longevity has been declining since the flood, says Cuozzo, and he quotes evidence that people are maturing earlier and earlier to this day. The evidence actually suggests that age at maturity, at least in Europe, has fluctuated through history, but Cuozzo argues for a regular, continuing trend from the Flood to now. He is able to do this by very carefully selecting his evidence, and by cavalierly dismissing contrary evidence which does not fit (such as the evidence from Aristotle that menarche occurred "in the 14th year of life" - p.192). Lapse of standards there, I'm afraid.

As for the equation of Neandertals with immediate post-flood people in the *Book of Genesis*, it fails the test of internal consistency. On p.253 there is a diagram of the decline of longevity from father to son, from Arpachsad (Shem's son) to Terah, implying that their achieved ages were characteristic of their respective cohorts, derived (with some allowances for different transliterations) from Genesis, 11:10-24; the genealogy goes Shem-Arphaxad-Salah-Eber-Peleg-Reu-Serug-Nahor-Terah, which is the same as that given by 1 Chronicles, 1:17-26 but *not* the same as that given by Luke, 3:34-36, who says that Arphaxad's son was called Cainan and it was he, not Arphaxad himself, who was the father of Sala (=Salah). Sorry, but if one genealogy is right, the other must be wrong. To bring up inconsistencies in the Bible may seem a bit petty, but if Cuozzo is going to insist that the assumption of Biblical inerrancy is as valid as what he calls the "assumption of evolution" then he must be able to show that the Bible really is inerrant and does not contradict itself.

Reading Cuozzo's book has been an interesting exercise. His obvious competence as a forensic anthropologist suggests that he could make important contributions in the professional literature, if only he could lay his paranoid fantasies to one side and let the facts, in his own words, "speak for themselves". There are not many creationists of whom one could say this. Yet he is firmly convinced that there is a gigantic "evolutionist" conspiracy, and this leads him to regard everyone else in the palaeoanthropology field as a fraud and, very likely, out to get him. His technical training in anatomy has not actually introduced him to the nature of science; in the end his book becomes an exercise in massaging the data to fit a Biblical mould.

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References cited

Cutler, R.G. 1975. Evolution of human longevity and the genetic complexity governing aging rate. *Proceedings of the National Academy of Science of the USA*, **72**:4664-4668.

Montgomery, P.Q., H.O.L.Williams, N.Reading & C.B.Stringer. 1994. An assessment of the temporal bone lesions of the Broken Hill cranium. *Journal of Archaeological Science*, **21**:331-337.

Schwartz, J.H. & I.Tattersall. 1996. Toward distinguishing *Homo neanderthalensis* from *Homo sapiens*, and vice versa. *Anthropologie*, **34**, 79-88.

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Stringer, C.B., M.C.Dean & R.D.Martin. 1990. A comparative study of cranial and dental development within a recent British sample and among Neandertals. *Primate Life History and Evolution*, 115-152. New York: Wiley-Liss, Inc.

Fossil Hominids: Big Daddy?

Big Daddy? is a small anti-evolution comic book tract by evangelist Jack Chick. Since there was already an excellent review of it on the web, I have included it here with permission of the author:

> Big Daddy?, reviewed by Cosma Shalizi
>
> Jack Chick writes Christian comic books. "So what?", you say. Dear Reader, you are obviously not familiar with what lurks in the lowest reaches of the American religion. I first encountered Chick's work as an undergraduate at Berkeley --- someone had been passing them out on the main campus square, and one of them found its way to the physics society. This classic was entitled Big Daddy? and the cover was graced by a grinning chimpanzee eating a banana. It told the story of the conflict between a born-again Christian high school student (who looked like a Hitler Youth recruiting poster) and his science teacher (who looked, not to put too fine a point on it, remarkably "Jewish"). The science teacher attempted to indoctrinate his class with the vile doctrines of secular humanism, an old earth and evolution: but the stalwart young man stood firm, secure in his God and his faith, and finally confuted him with the nucleus of the atom. Here, he said, were all these protons, of like charge, bound together: but don't like charges repel? What holds them together? The teacher is bereft, sweating, without answer. The youth triumphantly says, "Our Lord, Jesus Christ," and cites an epistle to the Corinthians. The class is converted; I forget what happens to the teacher. Most of us were taking nuclear physics at the time...
>
> [Some explanation may be necessary here. The forces holding atoms together are not familiar from everyday experience, but they are *very* well understood by nuclear physicists, thanks to decades of scientific experiments. Saying that "Jesus holds atoms together" is as hilariously ignorant as claiming that planets travel in ellipses because angels are pushing them around. -JF]
>
> Mr. Chick has been turning out this stuff since the '60s, and beneath the intense ignorance, anti-Catholicism, creationism, blood and gore, homophobia, sadistic fantasies about Hell, paranoid fantasies about Satanism, drugs and the apocalypse, and vicious resentment of others' prosperity (the only thing missing is explicit anti-semitism) --- or perhaps, because of all that --- there's a great deal of unintentional humor. It's an acquired taste, I admit.

The booklet briefly skims over a number of common creationist arguments, but, as one might expect from the title and cover illustration, human evolution comes in for special attention. The centerfold lists a supposed parade of human ancestors:

This is a typical rehashing of the usual creationist chestnuts. It ignores almost all the the real evidence, misrepresents the real fossils that are discussed (Heidelberg Man, Peking Man, Neandertal Man), of course mentions Nebraska Man and Piltdown Man, and finally lists some fossils that have never been claimed to be anything but *Homo sapiens* (New Guinea Man, Cro-Magnon Man)

The real oddity in Chick's list is "New Guinea Man". As far as I know, no one has *ever* proposed this as any sort of transitional form. It presumably refers to fragments of a fossil modern human skull thought to be about 5000 years old found at Aitape (now Eitape) about 60 years ago. This is the only human fossil ever found in New Guinea, and is very obscure; I have never seen it even mentioned in any mainstream scientific or popular literature on human origins. The only place (other than Big Daddy) I have ever seen it referred to is a 1961 book by Canadian creationist Evan Shute, Flaws in the Theory of Evolution. Shute merely mentions the existence of this fossil in a list of many other fossils and does not discuss it individually, so Chick may have found out about this fossil from another unknown source.

This little list has been widely copied. If you see a reference to New Guinea Man, or read that Heidelberg Man was "built from a jaw bone that was conceded by many to be quite human" or that Peking Man is "supposedly 500,000 years old, but all evidence has disappeared", you'll know it was cribbed from this little booklet.

References

Chick, J. 1972. Big Daddy? Chino, CA: Chick Publications.

Fenner, F.J. 1941. Fossil human skull fragments of probable Pleistocene age from Aitape, New Guinea. Records S.Australian Mus., 6:335-356.

Shute, E. 1961. Flaws in the theory of evolution. Nutley, NJ: Craig Press.

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http://www.talkorigins.org/faqs/homs/bigdaddy.html, 08/20/98

Review: The Genesis Mystery

Dr. Jeffrey Goodman's book The Genesis Mystery (1983) attempts to show that humans could not have evolved by natural selection, and that some form of outside intervention must be responsible for our most distinctive characteristics.

Goodman's book discusses topics including shamanism, human evolution, and the archaeological record of the Americas. This review will be confined to his treatment of human evolution.

Goodman says that:

> "For example, while modern man's brain is not particularly larger than that of his immediate predecessor, Neanderthal man, most experts acknowledge that it represents a great leap forward in its improved organization and its infinitely wider range of abilities." (p. 17)

This is news to me. It is true that, for unknown reasons, Neandertal culture does not display all the refinements of the Cro-Magnons, but the same is true of many early modern humans and archaic forms of *Homo sapiens*. While many have suggested that Neandertals may have differed behaviorally from us, I know of no modern scientist who claims that the Neandertal brain is visibly any different from, or worse organized, than ours. (In fact, rather than being larger as Goodman claims, modern brains are actually smaller than Neandertal brains on average, although this may be related to body size.) Trinkaus and Shipman, in a statement that seems representative of modern views, say:

> "Anatomically, the Neandertals are quite similar to ourselves, having a skeletal arrangement identical to ours, brains as large as ours, and - to the best of our knowledge - the capability to perform any act normally within the ability of a modern human." (p. 412)

Goodman claims each hominid species has a discrete cranial range that does not overlap with the range of the species supposed to succeed it. As evidence, he cites (p.180) a graph in a paper by Cronin et al. (1981), which supposedly shows that the cranial ranges of *A. africanus*, *H. habilis*, *H.erectus*, and *H. sapiens* do not overlap. In fact the bars in the graph (except for *H. sapiens*) do not represent the entire cranial range, but only 1 standard deviation on both sides. Cronin et al's data, given in text below the graph, clearly show that ranges *do* overlap. For example, the highest *H. habilis* value is 752, compared to 727 for the lowest *H. erectus* value, and 1225 for the highest *H. erectus* value, well into the normal human range, and well above the value of 1100 that Goodman claims is the top of the *H. erectus* range.

A similar graph taken from a book by Birdsell is similarly claimed by Goodman to show separate cranial ranges. Instead, it seems to be a graph plotting *average* brainsize against time for various species. The fact that these average values are separate tells us nothing about how widely brain sizes were spread about the mean. For example, the lowest point of Birdsell's line for *Homo erectus* is about 900cc, even though some *H. erectus* skulls are known with values smaller than that.

Goodman says:

> "Needless to say, there is no evidence of this transition [from *H. erectus* to *H.sapiens sapiens*] in the fossil record to date." (p.137)

Again, a statement that most scientists would find puzzling, to say the least. Fossils such as Petralona, Steinheim, Swanscombe, Saldanha, Rhodesian Man and Arago are excellent candidates for this transition. Goodman ignores most of these. Two he does mention, Rhodesian Man and Saldanha, he claims are *Homo erectus*, in spite of the fact that their brains sizes of about 1280 and 1250 cc are above the maximum *H. erectus* brain size of 1225 cc, which is in turn well above the value of about 1100 cc that Goodman claims is the maximum *H. erectus* brain size. These skulls are intermediate between *H. erectus* and *H. sapiens* in morphology, time, and brain size, nicely filling the gap which Goodman claims exists between them.

Goodman says that:

> "According to the traditional view, approximately 50,000 years ago, at the start of the last 1 percent of hominid evolutionary time, a natural miracle took place: Within a critical period of 5,000 years - just one-seventh of 1 percent of the time that has elapsed since the first-known australopithecine's

> day - we get more significant evolutionary change than in the other 99 6/7 percent of that time; ..." (p.186)

This statement can only be described as bizarre. Goodman gives the impression modern humans are thought to have evolved from Neandertals about 40,000 years ago, but even if that were true, the statement would still be absurd. The differences between Neandertals and modern humans are trivial; far, far less than those between either of them and australopithecines. Even *Homo erectus* is far more similar to modern humans than to australopithecines.

In fact, as Goodman was writing, newer finds were pushing back the earliest dates for *Homo sapiens sapiens* to a little over 100,000 years. Before that, there is a fair-sized group of intermediate fossils that are (and were, even in the early 80's) assigned to *H. sapiens*, but because of archaic features are not considered to be fully modern humans (*H. sapiens sapiens*). These fossils include Arago, Petralona, Steinheim, and Swanscombe and a number of others. Goodman ignores most of them, but misrepresents at least one: he calls the Rhodesian Man skull a late-surviving *H. erectus*, when it is, at 1280 cc., larger than any *erectus* skull and falls nicely into the morphological and temporal gaps which he claims separates *H. erectus* and *H. sapiens*.

Another oddity is Goodman's claim that the coexistence of two species (specifically, *H. erectus* and *H. sapiens*) shows that they cannot have an ancestor-descendent relationship. Many of the examples he uses to illustrate this point are faulty, due to the dubious dates and classification he gives for many fossils, but even if they were valid, the argument fails because evolution does not require an ancestor species to go extinct when a new species evolves from it.

Goodman points out, correctly, that the brow ridges of *Homo erectus* are more massive than those of *H. habilis* and *H. sapiens* and that this constitutes an evolutionary reversal, but says that:

> "Such a pattern of successive turnabouts in skull-wall thickness and brow size stand in direct opposition to the continuous developmental process Darwinians espouse." (p.179)

However no Darwinian process requires that evolutionary trends always continue in the same direction; natural selection can reverse a trend if it is beneficial to do.

I think Goodman misrepresents modern views. For example, he cites Lieberman and Crelin's attempts to reconstruct the Neandertal vocal cavity as if it was universally accepted, when in fact the opposite is much closer to the truth. The reconstruction not only had severe problems, but was based on a Neandertal skull (La-Chapelle-aux-Saints) later found to have been incorrectly reconstructed by Boule. (Trinkaus and Shipman, 1992)

There are many minor factual errors that show that Goodman is not very familiar with the literature on human evolution. He says that Olduvai Gorge is in Kenya (p. 50) when it is actually in Tanzania. Pithecanthropus IV, discovered in the late 1930's, "was a nearly complete skull", when it actually consisted of the back part of a brain case and an upper jaw. Goodman calls the *Homo habilis* fossil OH 7 discovered in 1961 by the nickname "Twiggy", when Twiggy is the nickname of OH 24, discovered in 1968. He misunderstands the mitochrondial Eve concept (p. 14), apparently believing that the age of mitochondrial Eve and the appearance of *Homo sapiens sapiens* must coincide, when there is not necessarily any relationship between the two. He calls the skulls found at Kow Swamp in Australia *H. erectus* when they are modern humans

When I read the words "outside intervention" in the subtitle of Goodman's book, I flippantly guessed that he either had a religious agenda, or was an "ancient astronaut" nut. This turns out to be fairly close to the mark, since Goodman's four options are: God, spacemen, hitchhiking spirits, or "other". Contrary to my expectations though, Goodman claims no committment to any of these alternatives.

Even if there was no fossil evidence of the evolution from *H. erectus* to *H. sapiens*, Goodman's theory would be unconvincing. There is no justification given for his belief that the changes involved in the origin of *H. sapiens* could not have been carried out by natural selection. Even if the fossil gap he claims exists really did exist, it could be that the transitional forms had not yet been detected. Such a conclusion would be far more parsimonious than Goodman's way-out theories.

Goodman claims that modern humans evolved (or that scientists think they did; it's hard to say which) in the space of 5000 years, but he never makes clear when this supposedly happened, and what the before and after points of the transition were. Some of his writing only makes sense if one assumes that Cro-Magnons evolved from

Neandertals in the period of 40,000 to 35,000 years ago. A sudden change could only be documented with reasonable confidence if there was a good record of non-modern fossils going up to a particular point in time, followed by the appearance of fully modern humans. The fossil record documents no such thing; we have modern humans appearing about 100,000 years ago, preceded by a number of more primitive fossils spread over the previous few hundred thousand years.

Goodman spends some time arguing that fully modern man, *Homo sapiens sapiens*, is older than 40,000 years. In this he is correct; when he wrote, recent discoveries were pushing back the appearance of modern man to over 100,000 years ago. But this wrecks his argument that modern man appeared suddenly. One can (or could, in 1981) argue that modern humans evolved in only a few thousand years from Neandertals, but by claiming that modern humans appeared over 100,000 years ago, Goodman wrecks his own claim, since there is no evidence a sudden appearance of modern humans at that earlier date.

In short, Goodman's work has no merit. His understanding of evolutionary theory is flawed, his knowledge of the human fossil record is superficial, he ignores or defines away data which does not support his ideas, and even some of the evidence he cites in his support is so badly misrepresented that it contradicts his claims instead of supporting them. The problems that Goodman's "outside intervention" hypothesis is supposed to solve simply do not exist. File this book under 'crackpots'.

References

Cronin J.E., Boaz N.T., Stringer C.B. and Rak Y.: Tempo and mode in hominid evolution. Nature 292:113-122, 1981.

Goodman, Jeffrey: The Genesis Mystery: a startling new theory of outside intervention in the development of modern man, New York:Times Books, 1983

Johanson, Donald C. and Edey, Maitland A.: Lucy: the beginnings of humankind, New York:Simon and Schuster, 1981.

Trinkaus E. and Shipman P.: The Neandertals: changing the image of mankind, New York:Alfred E. Knopf, 1992.

Hidden History, Hidden Agenda

A Review of The Hidden History of the Human Race, by Michael A. Cremo and Richard L. Thompson. Badger, CA: Govardhan Hill Publishing. 1994.

By Bradley T. Lepper

The Hidden History of the Human Race, by Michael A. Cremo and Richard L. Thompson, is an ideologically motivated assault on the conventional view of human evolution and prehistory. The authors claim "various humanlike and apelike beings have coexisted for long periods of time" (hundreds of millions of years, in fact) and that scientists have "systematically suppressed" the evidence for this incredible notion (p. xvii, 133).

The Hidden History of the Human Race is an abridged edition of Forbidden Archaeology, published by the Bhaktivedanta Institute in San Diego, and dedicated to "His Divine Grace, A. C. Ghaktivedanta Swami Prabhupada," the implications of which will be apparent below. In the preface to the abridgement Michael Cremo states the rationale for this leaner version: it's "shorter, more readable, and more affordable." In other words, they hope to reach a wider audience with their message that human evolution didn't happen the way the textbooks claim, and that generations of archaeologists and paleoanthropologists have conspired to conceal the truth from the public.

The original book has been reviewed in various places (Feder, 1994; Marks, 1994; Tarzia, 1994) and, as the substance of the work has not changed, the interested reader might want to consult these other reviews for different, if concordant, perspectives. It is worthwhile to consider the new abridgement because it is likely to be more widely read than its rather ponderous predecessor (in fact, it can be found in many mainstream bookstore chains, including Barnes and Noble).

The Hidden History of the Human Race is a frustrating book. The motivation of the authors, "members of the Bhaktivedanta Institute, a branch of the International Society for Krishna Consciousness" (p. xix), is to find support in the data of paleoanthropology and archaeology for the Vedic scriptures of India. Their methods are borrowed from fundamentalist Christian creationists (whom they assiduously avoid citing). They catalog odd "facts" which appear to conflict with the modern scientific understanding of human evolution and they take statements from the work of conventional scholars and cite them out of context to support some bizarre assertion which the original author would almost certainly not have advocated. Cremo and Thompson regard their collection of dubious facts as "anomalies" that the current paradigm of paleoanthropology cannot explain. Sadly, they offer no alternative paradigm which might accommodate both the existing data and the so-called anomalies they present; although they do indicate that a second volume is planned which will relate their "extensive research results" to their "Vedic source material" (p. xix). Kuhn noted that "To reject one paradigm without simultaneously substituting another is to reject science itself" (1970, p. 79); and that is precisely what Cremo and Thompson do. They claim that "mechanistic science" is a "militant ideology, skillfully promoted by the combined effort of scientists, educators, and wealthy industrialists, with a view towards establishing worldwide intellectual dominance" (p. 196).

The work is frustrating because it mixes together a genuine contribution to our understanding of the history of archaeology and paleoanthropology with a bewildering mass of absurd claims and an audaciously distorted review of the current state of paleoanthropology.

Cremo and Thompson are quite right about the extreme conservatism of many archaeologists and physical anthropologists. While an undergraduate at a prominent southwestern university, I participated in classroom discussions about the claims for a very early occupation at the Timlin site (in New York) which had just been announced. The professor surprised me when she stated flatly that, if the dates were correct, then it was "obviously not a site." This dismissal of the possibility of such an ancient site, without an examination of the data or even a careful reading of the published claim, is dogmatism of the sort rightfully decried by Cremo and Thompson. George Carter, the late Thomas Lee, and Virginia Steene-McIntyre are among those whose claims for very early humans in America have been met with unfortunate ad hominem attacks by some conservative archaeologists; but, regardless of how shamefully these scholars were treated, the fact remains that their claims have not been supported by sufficiently compelling evidence. Cremo and Thompson are wrong, however, when they condemn

scientists for demanding "higher levels of proof for anomalous finds than for evidence that fits within the established ideas about human evolution" (p. 49). It is axiomatic that extraordinary claims demand extraordinary evidence.

Cremo and Thompson have little understanding of history and almost no understanding of the disciplines of paleoanthropology and archaeology. In the introduction, Thompson is identified as a generic "scientist" and "a mathematician," while Cremo is "a writer and editor for books and magazines published by the Bhaktivedanta Book Trust" (p. xix). Their naive approach to history is revealed in their discussion of the alleged discovery of broken columns, "coins, handles of hammers, and other tools" quarried from limestone in France between 1786 and 1788 (p. 104). In order to establish the credibility of this report they note that it was published in the American Journal of Science in 1820. They attempt to support their charge that modern scientists are dogmatic by observing that "today, however, it is unlikely such a report would be found in the pages of a scientific journal" (p. 104). The American Journal of Science in the 1820s published many reports that would not be found in modern science journals. Mermaids (Shillaber 1823), sea serpents (American Journal of Science and Arts, 1826), and the efficacy of divining rods for locating water (Emerson, 1821) were topics of interest to scientists of that era. That such material was presented in a 19th century journal with "Science" in the title is no measure of its reliability or its relevance to modern science; likewise, that modern marine biologists no longer consider mermaids a worthy subject for research is no measure of their dogmatism. Cremo and Thompson might disagree, however, for they devote an entire chapter to reports of "living ape-men" such as Bigfoot, which, even if true, contribute nothing to their thesis that anatomically modern humans lived in geologically ancient times. Chimpanzees are "ape-men" of a sort, sharing 99% of our genetic makeup, and their coexistence with Homo sapiens sapiens does no violence to evolutionary theory.

Cremo and Thompson's ignorance of the basic data of archaeology is exemplified by their reference to the Venus of Willendorf as a work of "Neolithic" rather than Paleolithic art (p. 84) and their mistaken identification of a nondescript stone blade from Sandia Cave as a "Folsom point" (p. 93). Folsom points are highly specialized and distinctive artifacts and, although the excavators of Sandia Cave did recover several from that site, a Folsom point is not what is depicted in the photograph reproduced by Cremo and Thompson (p. 93). Moreover, although they have plumbed the depths of 19th-century literature in search of crumbs of data that support their rather vague notions about the extreme antiquity of Homo sapiens, they are not abreast of the latest developments in the field of archaeology. They refer to claims of great antiquity for artifacts from the Calico, Pedra Furada, Sandia Cave, Sheguiandah, and Timlin sites, but are apparently unaware of recent (and some not so recent) work concerning these sites which substantially refutes (or calls into serious question) the claims of the original investigators (e.g., Cole and Godfrey, 1977; Cole et al., 1978; Funk, 1977; Haynes and Agogino, 1986; Julig et al., 1990; Kirkland, 1977; Meltzer et al., 1994; Preston, 1995; Schnurrenberger and Bryan, 1985; Starna, 1977; Taylor, 1994).

This is a book designed to titillate, not elucidate. The authors discuss a weathered rock more than 200 million years old which they identify as a fossilized partial shoe sole (p. 115-116). They allude to "microphoto magnifications" of the fossilized stitches which allegedly show "the minutest detail of thread twist and warp" (p. 116), but do not present these magnified images. Instead, they reproduce a somewhat blurred photograph of the weathered outlines which do not, at least to this reviewer, resemble any portion of a shoe sole.

Cremo and Thompson discuss the three to four million year old fossilized footprints discovered at Laetoli, and note that scholars have observed "close similarities with the anatomy of the feet of modern humans" (p. 262). Cremo and Thompson conclude that these footprints actually are the tracks of anatomically modern humans, but they offer no explanation for why these individuals were not wearing the shoes which supposedly had been invented more than 296 million years earlier.

Cremo and Thompson are selectively credulous to an astonishing degree. They accept without question the testimony of 19th-century goldminers and quarrymen, but treat with extreme skepticism (or outright derision) the observations of 20th-century archaeologists. That Von Koenigswald purchased Pithecanthropus fossils from native Javanese causes Cremo and Thompson "uneasiness" (p. 164); but they blithely accept Taylor's purchase of the "Foxhall Jaw" from "a workman who wanted a glass of beer" (p. 133) without similar unease. The authors are critical of archaeologists for rejecting the very early radiometric dates for technologically recent stone artifacts at Hueyatlaco, Mexico (pp. 91-93), but they are as quick to reject radiometric dates which do not agree with their preconceived interpretations (pp. 125, 139-140).

Cremo and Thompson's claim that anatomically modern Homo sapiens sapiens have been around for hundreds of millions of years is an outrageous notion. Accepting that there is a place in science for seemingly outrageous hypotheses (cf. Davis, 1926) there is no justification for the sort of sloppy rehashing of canards, hoaxes, red herrings, half-truths and fantasies Cremo and Thompson offer in the service of a religious ideology. Readers who

are interested in a more credible presentation of the overwhelming evidence for human evolution should consult Ian Tattersall's wonderful recent book The Fossil Trail: how we know what we think we know about human evolution.

References

American Journal of Science, and Arts, 1826. "Sea Serpent." American Journal of Science, and Arts, 11:196

Cole, J. R., R. E. Funk, L. R. Godfrey, and W. Starna. 1978. "On Criticisms of 'Some Paleolithic Tools from Northeast north America': rejoinder." Current Anthropology, 193:665-669

Cole, J. R. and L. R. Godfrey. 1977. "On Some Paleolithic Tools from Northeast North America." Current Anthropology, 18(3):541-543.

Davis, W. M., 1926. "The Value of Outrageous Geological Hypotheses." Science, 63:463-468.

Emerson, R. 1821. "On the Divining Rod, With Reference to the Use Made of it in Exploring for Springs of Water." Oct. 23, 1820. American Journal of Science and Arts, 3:102-104.

Feder, K. L. 1994. "Review of Forbidden Archaeology: The Hidden History of the Human Race." Geoarchaeology, 9(4):337-230.

Funk, R. E. 1977. "On Some Paleolithic Tools from Northeast North America." Current Anthropology, 18(3):543-544.

Haynes, C. V., Jr. and G. A. Agogino. 1986. "Geochronology of Sandia Cave." Smithsonian Contributions to Anthropology, No. 32.

Julig, P. J., W. C. Mahaney, and P. L. Storck. 1991. "Preliminary Geoarchaeological Studies of the Sheguindah Site, Manitoulin Island, Canada." Current Research in the Pleistocene, 8:110-114.

Kirkland, J. 1977. "On Some Paleolithic Tools From Northeast North America." Current Anthropology, 18(3):544-545.

Kuhn, T. S. 1970. The Structure of Scientific Revolutions. 2nd edition. International Encyclopedia of Unified Science, Vol. 2, No. 2. University of Chicago Press.

Marks, J. 1994. "Review of Forbidden Archaeology: The Hidden History of the Human Race." American Journal of Physical Anthropology, 93(1):140-141.

Meltzer, D. J., J. M. Adovasio, and T. D. Dillehay. 1994. "On a Pleistocene Human Occupation at Pedra Furada, Brazil." Antiquity, 68(261):695-714.

Preston, D. 1994. "The Mystery of Sandia Cave." New Yorker, 12 June 1994, pp.66-83

Schnurrenberger, D. and A. L. Bryan. 1984. "A Contribution to the Study of the Naturefact/Artifact Controversy." In Stone Tool Analysis, M. G. Plew, J. C. Woods, and M. G. Pavesic, (eds.) pp.133-159. Albuquerque: University of New Mexico Press.

Shillaber, J. 1823. "Mermdid." (sic) American Journal of Science and Arts, 6:195-197

Starna, W. A. 1977. "On Some Paleolithic Tools from Northeast North America." Current Anthropology, 18(3):545.

Tarzia, W. 1994. "Forbidden Archaeology: Antievolutionism Outside the Christian Arena." Creation/Evolution, 14(1):13-25.

Taylor, R. E. 1994. "Archaeometry at the Calico Site." The Review of Archaeology, 15(2):1-8.

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Fossil Hominids: Further Reading

Because of the public interest in human evolution there is a wide choice of good books available, many of them written by leading scientists in the field.

An excellent introduction to human evolution is Johanson and Edgar (1996); it is the most up-to-date book available and also has the best photo gallery anywhere. Tattersall (1995) is also very up-to-date with an excellent discussion of how our knowledge of human evolution has developed. Reader (1981), Johanson and Edey (1981), Leakey and Lewin (1992), and Tattersall (1993) are good books at a slightly more popular level. An excellent recent book about *Homo erectus* is Walker and Shipman (1996). Good sources about the Neandertals are Trinkaus and Shipman (1992), Shreeve (1995), and Gore (1996). For historical background, try Morell (1995), a fascinating biography of the Leakey family.

Short articles which give a good account of human evolution are Weaver (1985) (which has good comparative photographs), Brace (1983) and Berra (1990).

Sources which address creationist arguments about human evolution are Strahler (1987), and the Winter 1986-87 edition of the journal Creation/Evolution, available from the National Center for Science Education (NCSE).

Good anthropology textbooks include Klein (1989), Feder and Park (1989), and Campbell (1988). Other academic works of interest are Brace et al. (1979), which contains line drawings and brief descriptions of about 50 important fossils, and Day (1986), which contains an extensive and detailed list of fossils obtained from about 50 major sites, along with many photographs. For extremely detailed and technical descriptions of many important fossils, see Wood (1991) or Tobias (1991).

The best creationist book on human fossils is probably Lubenow (1992). Lubenow has studied the scientific literature extensively, and limits his arguments to fossils accepted by evolutionists. His work is of a considerably higher standard than any other creationist literature I have read on the subject. Gish (1985) is a very influential creationist book with a large chapter on human evolution; an updated version has been recently released (Gish 1995). Another creationist book is Bowden (1981), although it concentrates heavily on older fossils.

Also, visit the Paleoanthropology Links page for lists of evolutionist and creationist web pages which discuss human origins, and the Paleoanthropology Fiction page for a list of fictional works about human evolution.

References

Berra T. (1990): The evolution of life and the rise of humans. In Evolution and the myth of creationism. (pp. 70-119). Stanford,California: Stanford University Press.

Bowden M. (1981): Ape-men: fact or fallacy? Ed. 2. Bromley,Kent: Sovereign.

Brace C.L., Nelson H., Korn N., and Brace M.L. (1979): Atlas of human evolution. Ed. 2. Holt, Rinehart and Winston.

Brace C.L. (1983): Humans in time and space. In L.R. Godfrey (Ed.), Scientists confront creationism. (pp. 245-82). Toronto: George J. McLeod.

Campbell B.G. (1988): Humankind emerging. Ed. 5. Boston: Little, Brown and Company.

Day M.H. (1986): Guide to fossil man. Ed. 4. Chicago: University of Chicago Press. (an extensive listing of major hominid fossils)

Feder K.L. and Park M.A.: Human antiquity: an introduction to physical anthropology and archaeology, Mountain View, California:Mayfield Publishing, 1989. (an introductory university-level anthropology textbook)

Gish D.T. (1985): Evolution: the challenge of the fossil record. El Cajon, CA: Creation-Life Publishers.

Gore R. (1996): Neandertals. National Geographic, 189(January):2-35.

Johanson D.C. and Edey M.A. (1981): Lucy: the beginnings of humankind. New York: Simon and Schuster. (a

short history of paleoanthropology, and the discovery and analysis of *Australopithecus afarensis*)

Johanson D.C. and Edgar B. (1996): From lucy to language. New York: Simon and Schuster. (up-to-date, with a superb photo gallery)

Klein R.G. (1989): The human career: human biological and cultural origins. Chicago: University of Chicago Press. (an excellent textbook on human evolution)

Leakey R.E. and Lewin R. (1992): Origins reconsidered: in search of what makes us human. New York: Doubleday.

Lubenow M.L. (1992): Bones of contention: a creationist assessment of human fossils. Grand Rapids,MI: Baker Books. (the best creationist book on human fossils)

Morell V. (1995): Ancestral passions: the Leakey family and the quest for humankind's beginnings. New York: Simon & Schuster.

Reader J. (1981): Missing links: the hunt for earliest man. Boston,MA: Little,Brown. (a popular history of paleoanthropology, with many good pictures)

Shreeve J. (1995): The neandertal enigma: solving the mystery of human origins. New York: William Morrow. (covers current debates about Neandertals and the appearance of modern humans)

Strahler A.N. (1987): Science and earth history: the evolution/creation controversy. Buffalo: Prometheus Books. (an encyclopedic resource on creationist arguments)

Tattersall I. (1995): The fossil trail: how we know what we think we know about human evolution. Oxford,NY: Oxford University Press.

Tobias P.V. (1991): Olduvai gorge, volume 4: the skulls, endocasts and teeth of *Homo habilis*. Cambridge: Cambridge University Press.

Trinkaus E. and Shipman P. (1992): The neandertals: changing the image of mankind. New York: Alfred E. Knopf. (an excellent history of thought about Neandertals)

Weaver K.F. (1985): The search for our ancestors. National Geographic, 168(November):560-623.

Wood B.A.: Koobi Fora research project, volume 4: hominid cranial remains, Oxford:Clarendon Press, 1991. (a detailed study of fossils from the East Rudolf area)

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http://www.talkorigins.org/faqs/homs/reading.html, 04/28/97

Fossil Hominids: References

Abbate E., Albianelli A., Azzaroli A., Benvenuti M., Tesfamariam B., Bruni P. et al. (1998): A one-million-year-old *Homo* cranium from the Danakil (Afar) depression of Eritrea. Nature, 393:458.

Aiello L. and Dean C. (1990): An introduction to human evolutionary anatomy. London: Academic Press.

Angela P.&P. (1993): The extraordinary story of human origins. Buffalo NY: Prometheus Books.

Asfaw B., White T.D., Lovejoy C.O., Latimer B., Simpson S., and Suwa G. (1999): *Australopithecus garhi*: a new species of early hominid from Ethiopia. Science, 284:629-35.

Bermudez de Castro J.M., Arsuaga J., Carbonell E., Rosas A., Martinez I., and Mosquera M. (1997): A hominid from the lower Pleistocene of Atapuerca, Spain: possible ancestor to Neandertals and modern humans. Science, 276:1392-5.

Berra T. (1990): The evolution of life and the rise of humans. In Evolution and the myth of creationism. (pp. 70-119). Stanford,California: Stanford University Press.

Borja C., Garcia-Pacheco M., Olivares E.G., Scheuenstuhl G., and Lowenstein J.M. (1997): Immunospecificity of albumin detected in 1.6 million-year-old fossils from Venta Micena, in Orce, Granada, Spain. American Journal of Physical Anthropology, 103:433-41.

Boule M. (1937): Le Sinanthrope. L'Anthropologie, 47:1-22

Boule M. and Vallois H. (1957): Fossil Men. Ed. 4. New York: Dryden Press. (outdated, but with a lot of information about early finds)

Bowden M. (1981): Ape-men: fact or fallacy? Ed. 2. Bromley,Kent: Sovereign.

Brace C.L. (1983): Humans in time and space. In L.R. Godfrey (Ed.), Scientists confront creationism. (pp. 245-82). Toronto: George J. McLeod.

Brace C.L. (1986): Creationists and the pithecanthropines. Creation/Evolution, Issue 19:16-23. (discusses creationist arguments about Java Man and Peking Man)

Brace C.L., Nelson H., Korn N., and Brace M.L. (1979): Atlas of human evolution. Ed. 2. Holt, Rinehart and Winston.

Bromage T.G. (1992): Faces from the past. New Scientist, (11 January 1992) 133:38-41.

Broom R. (1936): A new fossil anthropoid skull from South Africa. Nature, 138:486-8. (announcement of the discovery of the second australopithecine fossil)

Broom R. (1938): The pleistocene anthropoid apes of South Africa. Nature, 142:377-9. (announcement of the discovery of *Australopithecus robustus*)

Broom R. and Robinson J.T. (1947): Further remains of the Sterkfontein ape-man, *Plesianthropus*. Nature, 160:430-1.

Brown F., Harris J., Leakey R.E., and Walker A.C. (1985): Early *Homo erectus* skeleton from west lake Turkana, Kenya. Nature, 316:788-92. (announcement of the discovery of the Turkana Boy skeleton)

Brown P. (1981): Artificial cranial deformation: a component in the variation in pleistocene Australian aboriginal crania. Archaeology in Oceania, 16:156-67.

Brunet M., Beauvilain A., Coppens Y., Heintz E., Moutaye A.H.E., and Pilbeam D. (1995): The first australopithecine 2,500 kilometres west of the rift valley (Chad). Nature, 378:273-5.

Burenhult G. (1993): The first humans: human origins and history to 10,000 BC. New York: HarperCollins. (large beautifully illustrated book, but with more emphasis on cultural aspects than on the fossils)

Campbell B.G. (1988): Humankind emerging. Ed. 5. Boston: Little, Brown and Company.

Clarke R.J. and Tobias P.V. (1995): Sterkfontein member 2 foot bones of the oldest South African hominid. Science, 269:521-4.

Conrad E.C. (1982): Are there human fossils in the "wrong place" for evolution? Creation/Evolution, Issue 8:14-22.

Cronin J.E., Boaz N.T., Stringer C.B., and Rak Y. (1981): Tempo and mode in hominid evolution. Nature, 292:113-22. (argues that hominid evolution is an example of gradual change rather than punctuated equilibrium)

Cuozzo J.W. (1998): Buried alive: the startling truth about Neanderthal man. Green Forest, Arkansas: Master Books.

Dart R.A. (1925): *Australopithecus africanus*: the man-ape of South Africa. Nature, 115:195-9. (announcement of the discovery of the Taung skull)

Day M.H. (1986): Guide to fossil man. Ed. 4. Chicago: University of Chicago Press. (an extensive listing of major hominid fossils)

Delson E. (1997): One skull does not a species make. Nature, 389:445-6.

Dexter R.W. (1986): Historical aspects of the Calaveras skull controversy. American Antiquity, 51:365-9.

Duarte C., Mauricio J., Pettitt P.B., Souto P., Trinkaus E., van der Plicht H. et al. (1999): The early upper Paleolithic human skeleton from the Abrigo do Lagar Velho (Portugal) and modern human emergence in Iberia. Proc.Natl.Acad.Sci.USA, 96:7604-9.

Falk D. (1983): Cerebral cortices of east African early hominids. Science, 221:1072-4.

Feder K.L. and Park M.A. (1989): Human antiquity: an introduction to physical anthropology and archaeology. Mountain View,CA: Mayfield Publishing. (an introductory university-level anthropology textbook)

Feldesman M.R. (1982): Morphometric analysis of the distal humerus of some Cenozoic catarrhines: the late divergence hypothesis revisited. American Journal of Physical Anthropology, 59:73-95.

Fezer K.D. (1993): Creation's incredible witness: Duane T. Gish, Ph.D. Creation/Evolution, Issue 33:5-21.

Frair W. (1993): Additional information on the Freiberg human skull composed of coal. Creation Science Research Quarterly, 30(1):36-9.

Gamble C. (1993): Timewalkers: the prehistory of global colonization. Cambridge, Massachussets: Harvard University Press.

Gibert J. and Palmqvist P. (1995): Fractal analysis of the Orce skull sutures. Journal of Human Evolution, 28:561-75.

Gish D.T. (1979): Evolution: the fossils say no! Ed. 3. San Diego: Creation-Life Publishers. (this is the third edition of a book first published in 1972 and is quite out of date)

Gish D.T. (1985): Evolution: the challenge of the fossil record. El Cajon, CA: Creation-Life Publishers. (an updated version of Gish 1979)

Gish D.T. (1993): The "missing links" are still missing (part 2). Science, Scripture and Salvation (ICR radio show), Sep 18:

Gish D.T. (1995): Evolution: the fossils still say no! El Cajon, CA: Institute for Creation Research. (an updated version of Gish 1985)

Gore R. (1996): Neandertals. National Geographic, 189(January):2-35.

Gould S.J. (1991): An essay on a pig roast. In Bully for brontosaurus. (pp. 432-47). New York: W.W.Norton. (an essay on the Nebraska Man episode)

Gould S.J. (1993): Men of the thirty-third division. In Eight little piggies. (pp. 124-37). New York: W.W.Norton. (an essay about Eugene Dubois' theories on Java Man)

Graf W. and Vidal P. (1996): Semicircular canal size and upright stance are not interrelated. Journal of Human Evolution, 30:175-81.

Gregory W.K. (1927): Hesperopithecus apparently not an ape nor a man. Science, 66:579-81. (identifies the Nebraska Man tooth as belonging to a peccary)

Groves C. (1999): Book review: Buried alive: the startling truth about Neanderthal man. Reports of the National Center for Science Education, (Jan/Feb 1999) 19(1):27-9.

Hartwig-Scherer S. and Martin R.D. (1991): Was "Lucy" more human than her "child"? Observations on early hominid postcranial skeletons. Journal of Human Evolution, 21:439-49. (a comparison of Lucy and OH 62)

Hill A., Ward S., Deino A., Curtis G., and Drake R. (1992): Earliest *Homo*. Nature, 355:719-22. (claims that a fossil from genus *Homo* is 2.4 million years old)

Hillaby J. (1972): Dem ole bones. New Scientist, (21 December 1972) 56:825 (a skeptical look at the importance of ER 1470)

Hooijer D.A. (1951): The geological age of Pithecanthropus, Meganthropus and Gigantopithecus. American Journal of Physical Anthropology, 9:265-81. (dating of Javan fossils)

Howell F.C., Haesaerts P., and de Heinzelin J. (1987): Depositional environments, archeological occurrences and hominids from Members E and F of the Shungura formation (Omo basin, Ethiopia). Journal of Human Evolution, 16:665-700.

Howell F.C., Washburn S.L., and Ciochon R.L. (1978): Relationship of *Australopithecus* and *Homo*. Journal of Human Evolution, 7:127-31. (argues against the conclusions of Oxnard 1975)

Howgate M. and Lewis A. (1984): The case of miocene man. New Scientist, (29 March 1984)44-5.

Hrdlicka A. (1939): Normal micro- and macrocephaly in America. American Journal of Physical Anthropology, 25:1-91. (a study of extreme brain sizes in American skulls)

Huang W., Ciochon R., Gu Y., Larick R., Fang Q., Schwarcz H.P. et al. (1995): Early *Homo* and associated artefacts from Asia. Nature, 378:275-40.

Hublin J., Spoor F., Braun M., Zonneveld F., and Condemi S. (1996): A late neanderthal associated with upper palaeolithic artefacts. Nature, 381:224-6.

Hughes A.R. and Tobias P.V. (1977): A fossil skull probably of the genus *Homo* from Sterkfontein, Transvaal. Nature, 265:310-2. (announcement of the discovery of the skull Stw 53)

Huse S.M. (1983): The collapse of evolution. Baker Book House Company.

Ivanhoe F. (1970): Was Virchow right about neandertal? Nature, 227:577-8. (claims that Neandertal morphology was caused by rickets)

Jia L. and Huang W. (1990): The story of Peking man. Beijing: Foreign Languages Press. (the senior author, Jia Lanpo, has been involved with the Peking Man site since 1931)

Johanson D.C., Masao F.T., Eck G.G., White T.D., Walter R.C., Kimbel W.H. et al. (1987): New partial skeleton of *Homo habilis* from Olduvai gorge, Tanzania. Nature, 327:205-9. (some paleoanthropological history, and the discovery of OH 62)

Johanson D.C. and Edey M.A. (1981): Lucy: the beginnings of humankind. New York: Simon and Schuster. (a short history of paleoanthropology, and the discovery and analysis of *Australopithecus afarensis*)

Johanson D.C. and Edgar B. (1996): From Lucy to language. New York: Simon and Schuster. (up-to-date, with a superb photo gallery)

Johanson D.C. and Shreeve J. (1989): Lucy's child: the discovery of a human ancestor. New York: Early Man Publishing, Inc.

Johanson D.C. and Taieb M. (1976): Plio-pleistocene hominid discoveries in Hadar, Ethiopia. Nature, 260:293-7.

Johanson D.C. and White T.D. (1980): On the status of *Australopithecus afarensis*. Nature, 207:1104-5.

Kahn P. and Gibbons A. (1997): DNA from an extinct human. Science, 277:176-8.

Kennedy G.E. (1984): Are the Kow swamp hominids "archaic"? American Journal of Physical Anthropology, 65:163-8. (compares femurs of Australian aboriginals and *Homo erectus*)

Kimbel W.H., Walter R.C., Johanson D.C., Reed K.E., Aronson J.L., Assefa Z. et al. (1996): Late pliocene *Homo* and oldowan tools from the Hadar formation (kada hadar member), Ethiopia. Journal of Human Evolution, 31:549-61.

Kimbel W.H., Johanson D.C., and Rak Y. (1994): The first skull and other new discoveries of *Australopithecus afarensis* at Hadar, Ethiopia. Nature, 368:449-51.

Klein R.G. (1989): The human career: human biological and cultural origins. Chicago: University of Chicago Press. (an excellent textbook on human evolution)

Krings M., Stone A., Schmitz R.W., Krainitzki H., Stoneking M., and Paabo S. (1997): Neandertal DNA sequences and the origin of modern humans. Cell, 90:19-30.

Kuban G.J. (1996): On the heels of dinosaurs: an informal history of the Texas "man track" controversy.

Kunzig R. (1997): The face of an ancestral child. Discover, 18, 88-101.

Lague M.R. and Jungers W.L. (1996): Morphometric variation in plio-pleistocene hominid distal humeri. American Journal of Physical Anthropology, 101:401-27.

Leakey L.S.B. (1959): A new fossil skull from Olduvai. Nature, 184:491-3. (announcement of the discovery of *Australopithecus boisei*)

Leakey L.S.B. (1961): New finds at Olduvai gorge. Nature, 189:649-50. (announcement of the discovery of the OH 7 and OH 9 fossils)

Leakey L.S.B., Tobias P.V., and Napier J.R. (1964): A new species of the genus *Homo* from Olduvai gorge. Nature, 202:7-10. (paper proposing *Homo habilis* as a new species)

Leakey L.S.B. (1974): By the evidence: memoirs, 1932-1951. New York: Harcourt Brace Jovanovitch.

Leakey M.D. (1984): Disclosing the past. New York: Doubleday. (Mary Leakey's autobiography)

Leakey M.G., Feibel C.S., McDougall I., and Walker A.C. (1995): New four-million-year old hominid species from Kanapoi and Allia bay, Kenya. Nature, 376:565-71. (announcement of the discovery of *Australopithecus anamensis*)

Leakey R.E. (1973): Evidence for an advanced plio-pleistocene hominid from east Rudolf, Kenya. Nature, 242:447-50. (announcement of the discovery of the skull ER 1470)

Leakey R.E. (1974): Further evidence of lower pleistocene hominids from east rudolf, north Kenya, 1973. Nature, 248:653-6. (announcement of discoveries including ER 1805 and ER 1813)

Leakey R.E. (1984): One Life: an autobiography. Salem, NH: Salem House.

Leakey R.E. (1994): The origin of humankind. New York: BasicBooks.

Leakey R.E. and Lewin R. (1992): Origins reconsidered: in search of what makes us human. New York: Doubleday.

Leakey R.E. and Walker A.C. (1976): *Australopithecus*, *Homo erectus* and the single species hypothesis. Nature,

261:572-4. (discusses the significance of the ER 406 and ER 3733 fossils)

Leakey R.E. and Walker A.C. (1985): *Homo erectus* unearthed. National Geographic, 168(November):624-9. (an account of the discovery of the Turkana Boy skeleton)

Lewin R. (1987): Bones of contention: controversies in the search for human origins. New York: Simon and Schuster. (discusses in detail some of the major controversies that have occurred in paleoanthropology)

Lippard J.L. (1997): Lucy's knee joint: how creationists deal with their errors. (a talk.origins FAQ file)

Lubenow M.L. (1996): Palaeoanthropology in review. Creation Ex Nihilo Technical Journal, 10:10-7.

Lubenow M.L. (1992): Bones of contention: a creationist assessment of human fossils. Grand Rapids,MI: Baker Books. (the best creationist book on human fossils)

McHenry H.M., Berger L.R. (1998): Body proportions in *Australopithecus afarensis* and *A. africanus* and the origin of the genus *Homo*. Journal of Human Evolution, 35:1-22.

McHenry H.M. (1986): The first bipeds: a comparison of the *A. afarensis* and *A. africanus* postcranium and implications for the evolution of bipedalism. Journal of Human Evolution, 15:177-91. (an overview of the evidence for australopithecine bipedality)

McHenry H.M. and Corruccini R.S. (1976): Fossil hominid femora and the evolution of walking. Nature, 259:657-8.

Meikle W.E. and Parker S.T. (1994): Naming our Ancestors: an anthology of hominid taxonomy. Illinois: Waveland Press.

Mehlert A.W. (1996): *Australopithecus* and *Homo habilis* - pre-human ancestors? Creation Ex Nihilo Technical Journal, 10.2:219-40.

Menton D.N. (1988): The scientific evidence for the origin of man. (a creationist article)

Morell V. (1995): Ancestral passions: the Leakey family and the quest for humankind's beginnings. New York: Simon & Schuster.

Morris H.M. (1974): Scientific creationism. Santee,California: Master Books.

Morris H.M. and Parker G.E. (1982): What is creation science? San Diego: Creation-Life Publishers.

Morris J.D. (1994): Has the "missing link" been found? Acts & Facts, 23.11:d (ICR commentary on *Australopithecus ramidus* and *afarensis*)

Moya-Sola S. and Kohler M. (1997): The Orce skull: anatomy of a mistake. Journal of Human Evolution, 30:91-7.

O'Connell, P. (1969): Science of Today and the Problems of Genesis. Hawthorne, CA: Christian Book Club of America

Osborn H.F. (1922): Hesperopithecus, the anthropoid primate of western Nebraska. Nature, 110:281-3.

Oxnard C. (1975): The place of the australopithecines in human evolution: grounds for doubt? Nature, 258:389-95. (suggests that the australopithecines are no more closely related to humans than apes are)

Oxnard C. (1987): Fossils, teeth and sex. Hong Kong: Hong Kong University Press.

Palmqvist P. (1997): A critical re-evaluation of the evidence for the presence of hominids in lower Pleistocene times at Venta Micena, southern Spain. Journal of Human Evolution, 33:83-9.

Patterson B. and Howells W.W. (1967): Hominid humeral fragment from early pleistocene of northwestern Kenya. Science, 156:64-6. (discovery and analysis of the KP 271 fossil humerus)

Reader J. (1981): Missing links: the hunt for earliest man. Boston,MA: Little,Brown. (a popular history of paleoanthropology, with many good pictures)

Schrenk F., Bromage T.G., Betzler C.G., Ring U., and Juwayeyi Y.M. (1993): Oldest *Homo* and pliocene biogeography of the Malawi rift. Nature, 365:833-6. (announcement of the discovery of a very old *Homo* mandible)

Semaw S., Renne P., Harris J.W.K., Feibel C.S., Bernor R.L., Fesseka N. et al. (1997): 2.5-million-year-old stone tools from Gona, Ethiopia. Nature, 385:333-6.

Sharp D. (1997): Neanderthal and chain mail armor.

Shipman P. (1994): Those ears were made for walking. New Scientist, (July 30, 1994) 143:26-9.

Shreeve J. (1995): The neandertal enigma: solving the mystery of human origins. New York: William Morrow. (covers current debates about Neandertals and the appearance of modern humans)

Smith G.E. (1922): Hesperopithecus: the ape-man of the western world. Illustrated London News, 160:942-4.

Smith G.E. (1927): The evolution of man. Ed. 2. London: Oxford University Press.

Spoor F., Wood B.A., and Zonneveld F. (1994): Implications of early hominid labyrinthine morphology for evolution of human bipedal locomotion. Nature, 369:645-8.

Spoor F., Wood B.A., and Zonneveld F. (1996): Evidence for a link between human semicircular canal size and bipedal behaviour. Journal of Human Evolution, 30:183-7.

Stern J.T., Jr. and Susman R.L. (1983): The locomotor anatomy of *Australopithecus afarensis*. American Journal of Physical Anthropology, 60:279-317.

Strahler A.N. (1987): Science and earth history: the evolution/creation controversy. Buffalo: Prometheus Books. (an encyclopedic resource on creationist arguments)

Straus W.L., Jr. and Cave A.J.E. (1957): Pathology and posture of neanderthal man. Quarterly Review of Biology, 32(4):348-63. (showed that Neandertals were fully modern in posture)

Susman R.L. (1994): Fossil evidence for early hominid tool use. Science, 265:1570-3.

Suwa G., Asfaw B., Beyene Y., White T.D., Katoh S., Nagaoka S. et al. (1997): The first skull of *Australopithecus boisei*. Nature, 389:489-92.

Tattersall I. (1993): The human odyssey: four million years of human evolution. New York: Prentice Hall.

Tattersall I. (1995): The fossil trail: how we know what we think we know about human evolution. Oxford,NY: Oxford University Press.

Tattersall I., Schwartz J.H. (1996): Significance of some previously unrecognized apomorphies in the nasal region of *Homo neanderthalensis*. Proc.Natl.Acad.Sci.USA 93:10852-10854

Tattersall I. and Schwartz J.H. (1999): Hominids and hybrids: the place of Neanderthals in human evolution. Proc.Natl.Acad.Sci.USA, 96:7117-9.

Taylor I. (1995): Nebraska man goes to court. Science, Scripture and Salvation (ICR radio show), Jul 8:

Taylor P.S. (1992): The illustrated origins answer book. Ed. 4. Mesa,Arizona: Eden Productions. (a creationist book notable for its excellent index and list of references)

Taylor R.E., Payen L.A., and Slota P.J., Jr. (1992): The age of the Calaveras skull: dating the "Piltdown man" of the new world. American Antiquity, 57:269-75.

Teilhard de Chardin P. (1930): Sinanthropus pekinensis: an important discovery in human palaeontology. Revue des Questions Scientifiques, July 20: (discovery of the first Peking Man skull; reprinted in English translation in The Appearance of Man, 1965)

Theunissen B. (1989): Eugene Dubois and the ape-man from Java. Dordrecht,The Netherlands: Kluwer Academic Publishers.

Thorne A.G. and Macumber P.G. (1972): Discoveries of late pleistocene man at Kow swamp, Australia. Nature, 238:316-9.

Tobias P.V. (1970): Brain size, grey matter and race - fact or fiction? American Journal of Physical Anthropology, 32:3-31.

Tobias P.V. (1987): The brain of *Homo habilis*: a new level of organization in cerebral evolution. Journal of Human Evolution, 16:741-61.

Tobias P.V. (1991): Olduvai gorge, volume 4: the skulls, endocasts and teeth of *Homo habilis*. Cambridge: Cambridge University Press.

Trinkaus E. and Howells W.W. (1979): The neanderthals. Scientific American, 241(6):118-33. (a good summary of Neandertal anatomy)

Trinkaus E. and Shipman P. (1992): The neandertals: changing the image of mankind. New York: Alfred E. Knopf. (an excellent history of thought about Neandertals)

Tuttle R.H. (1990): The pitted pattern of Laetoli feet. Natural History, (March 1990)61-4.

Walker A.C. and Leakey R.E. (1993): The Nariokotome *Homo erectus* skeleton. Cambridge,MA: Harvard University Press. (a volume of papers about the Turkana Boy skeleton WT 15000)

Walker A.C. and Shipman P. (1996): The wisdom of the bones. New York: Alfred E. Knopf. (a popular history of *Homo erectus* and the discovery and analysis of the Turkana Boy skeleton)

Weaver K.F. (1985): The search for our ancestors. National Geographic, 168(November):560-623.

Weidenreich F. (1937): The new discovery of three skulls of *Sinanthropus pekinensis*. Nature, 139:269-72.

Whitcomb J.C. and Morris H.M. (1961): The genesis flood: the biblical record and its scientific implications. Grand Rapids,MI: Baker Books.

White T.D., Suwa G., and Asfaw B. (1994): *Australopithecus ramidus*, a new species of early hominid form Aramis, Ethiopia. Nature, 371:306-12.

Wieland C. (1994): New evidence: only people ever walked really upright. Creation Ex Nihilo Technical Journal, 8:127-8.

Willis D. (1989): The hominid gang: behind the scenes in the search for human origins. New York: Viking.

Willis T. (1987): Lucy goes to college. Bible-Science Newsletter, January:1-3. (claims that Lucy consisted of fossils found at two different sites)

Wills C. (1993): The runaway brain: the evolution of human uniqueness. New York: Basic Books.

Wolf J. and Mellett J.S. (1984): The role of "Nebraska man" in the creation-evolution debate. Creation/Evolution, Issue 16:31-43.

Wolpoff M.H., Wu X.Z., and Thorne A.G. (1984): Modern *Homo sapiens* origins: a general theory of hominid evolution involving the fossil evidence from east Asia. In F.H. Smith & F. Spencer (Eds.), The origins of modern humans. (pp. 465-7). New York: Alan R. Liss.

Wood B.A. (1991): Koobi Fora research project, volume 4: hominid cranial remains. Oxford: Clarendon Press. (a detailed study of fossils from the east Rudolf area)

Wood B.A. (1992): Origin and evolution of the genus *Homo*. Nature, 355:783-90. (review article on the taxonomy of *Homo habilis*)

Wood B.A. (1994): The oldest hominid yet. Nature, 371:280-1. (commentary on the discovery of *Australopithecus ramidus*)

Wood B.A. and Collard M. (1999): The human genus. Science, 284:65-71.

Woodward A.S. (1921): A new cave man from Rhodesia, South Africa. Nature, 108:371-2. (announcement of the discovery of the Rhodesian Man fossil)

Wright D.J.M. (1971): Syphilis and neanderthal man. Nature, 229:409 (suggests that Neandertal morphology was caused by a disease such as syphilis)

Zihlman A.L. and Lowenstein J.M. (1996): A Spanish Olduvai? Current Anthropology, 37:695-7. (report on an international paleoanthropology conference at Orce)

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Fossil Hominids: Illustrations

This page lists illustrations from this web site. For more images, visit the Human Paleontology Photo Gallery at Cleveland State University

AL 288-1, "Lucy"
Taung Child
Sts 5, "Mrs Ples"
Sts 14
OH 5, "Zinjanthropus", "Nutcracker Man"
KNM-ER 406
OH 24, "Twiggy"
KNM-ER 1470
KNM-ER 1813
Stw 53
Trinil 2, "Java Man", "Pithecanthropus I"
Sangiran 2, "Pithecanthropus II"
"Heidelberg Man", "Mauer Jaw"
Peking Man
KNM-ER 3733
KNM-WT 15000, "Turkana Boy"
La-Chapelle-aux-Saints, "Old Man"
"Rhodesian Man", "Kabwe Man"
Petralona 1
Cro-Magnon 1
Wadjak 1

Drawing of the Nebraska Man tooth
Artist's impression of Nebraska Man
Images of Neandertals

Side and lower views of crania of a gorilla, *A. africanus* and *Homo sapiens*
Side and upper views of lower jaws (mandibles) of a gorilla, *A. africanus* and *Homo sapiens*
Pelvis, femur and foot of a chimpanzee, *A. africanus*, and *Homo sapiens*
Side views of skulls of a gorilla, reconstruction of Peking Man, and *Homo sapiens*
Rear views of skulls of a gorilla, reconstruction of Peking Man, and *Homo sapiens*
Top views of skulls of a chimpanzee, Java Man, and a Neandertal
Side views of a monkey skull and a cast of Peking Man
Front, side, back and top views of ER 1470 and ER 1813

Java Man and Turkana Boy
Peking Man and *Homo erectus*
Comparison of all skulls

Skull of chimpanzee
Skull of gorilla

Eugene Dubois
Marcellin Boule
Davidson Black
Franz Weidenreich

This page is part of the Fossil Hominids FAQ at the talk.origins Archive.

http://www.talkorigins.org/faqs/homs/illustr.html, 07/31/98

Fossil Hominids: Type Specimens

Under the formal rules for naming species, each species must have a *type specimen*. The 'type description' of a species describes the type specimen, and the similarities to and differences from closely related species. Another fossil belongs to the same species if and only if it belongs to the same species as the type specimen. Obviously this is a subjective assessment, but this rule ensures that all scientists are at least using the same criteria when trying to allocate specimens to species. When scientific thinking about the classification of specimens changes, there are complicated rules which determine how specimens should be allocated to species.

If two type specimens are later determined to belong to the same species, then the first one named takes priority. For example, when it was decided that the 2nd known australopithecine fossil, assigned to *Plesianthropus transvaalensis*, actually belonged to the same species as the first, that name became invalid and all *Plesianthropus* fossils were reassigned to *Australopithecus africanus*.

If it is decided that the fossils previously assigned to a species actually belong to two different species, then the type specimen and any other specimens belonging to the same species as it keep the old name. The other fossils will take the name of whichever specimen among them is first used as a type specimen for a new species definition. An example is *Homo habilis* (type specimen OH 7); the species *Homo rudolfensis*, with type specimen ER 1470, consists of fossils formerly assigned to *habilis*.

Java Man (*Pithecanthropus erectus*) and Peking Man (*Sinanthropus pekinensis*) were originally assigned not only to different species, but different genera from *Homo sapiens*. Scientists such as Boule who considered them in the same genus but not necessarily the same species would sink *Sinanthropus* as a genus and call Peking Man *Pithecanthropus pekinensis*. Most scientists soon decided they were in the same species, so the Peking Man specimens were reassigned to *P. erectus* because that name had priority over *S. pekinensis*. Later, when it was decided that *P. erectus* was in the same genus as *Homo sapiens*, the genus name *Pithecanthropus* was sunk and the specific name *erectus* was kept, so the species became *Homo erectus*.

There is no central authority which proclaims that, for example, *Homo ergaster* is henceforth a valid species. Instead, the fate of a species name depends on the extent to which scientists accept the claim of its namers that it a valid species distinguishable from all others. Many of the following species names are not used in these pages, either because they are rarely used, or are so new that there is as yet no concensus on their validity.

Where two species names are given, the first is the one which was given by the original namer of the fossil, and the second name is the one by which it is usually known now. This often occurs when the genus name originally assigned is rejected and the fossil is placed in another genus.

For anyone interested in the naming and classification of hominids, an indispensable reference is Naming our Ancestors (Meikle and Parker, 1994). This useful book contains an introduction to the terms and principles of taxonomy, reprints of 15 sources in which hominid species were first named, and reprints of four papers which have been very influential in hominid taxonomy.

Species	Type Specimen	Named By
Australopithecus ramidus *Ardipithecus ramidus*	ARA-VP 6/1	White et al. 1994
Australopithecus anamensis	KP 29281	M. Leakey et al. 1995
Australopithecus afarensis	LH 4	Johanson et al. 1978
Homo antiquus	AL 288-1	Ferguson, 1984
Australopithecus bahrelghazali	KT 12/H1	Brunet et al. 1996
Australopithecus africanus	Taung	Dart 1925
Australopithecus garhi	BOU-VP-12/130	Asfaw et al. 1999

Paraustralopithecus aethiopicus *Australopithecus aethiopicus*	Omo 18	Arambourg & Coppens 1968
Paranthropus robustus *Australopithecus robustus*	TM 1517	Broom 1938
Australopithecus walkeri	KNM-WT 17000	Ferguson 1989
Zinjanthropus boisei *Australopithecus boisei*	OH 5	L. Leakey 1959
Paranthropus crassidens *Australopithecus crassidens*	SK 6	Broom 1949
Homo antiquus praegens *Australopithecus praegens*	KNM-T1 13150	Ferguson 1989
Homo habilis	OH 7	L. Leakey et al. 1964
Homo louisleakeyi	OH 9	Kretzoi 1984
Pithecanthropus rudolfensis *Homo rudolfensis*	KNM-ER 1470	Alexeev 1986
Homo microcranous	KNM-ER 1813	Ferguson 1995
Homo ergaster	KNM-ER 992	Groves & Mazak 1975
Pithecanthropus erectus *Homo erectus*	Trinil 2	Dubois 1894
Homo antecessor	ATD6-5	Arsuaga et al. 1997
Homo heidelbergensis	Mauer 1	Schoetensack 1908
Homo rhodesiensis	Kabwe	Woodward 1921
Homo neanderthalensis	Neandertal 1	King 1864
Homo sapiens	-	Linnaeus 1758

References

Meikle W.E. and Parker S.T. (1994): Naming our Ancestors: an anthology of hominid taxonomy. Prospect Heights, Illinois: Waveland Press.

International Code of Zoological Nomenclature

Curiosities of Biological Nomenclature, by Mark Isaak

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http://www.talkorigins.org/faqs/homs/typespec.html, 04/27/99

Fossil Hominids: Scientists

- Eugene Dubois
  Dubois discovered Java Man, the first *Homo erectus* fossil ever found.
- Raymond Dart
  Dart discovered the first australopithecine fossil in South Africa in 1924, and many others in the 1940's and 50's.
- Davidson Black
  Black was responsible for the discovery of the Peking Man skulls before his premature death.
- Robert Broom
  Broom was responsible for many of the early australopithecine discoveries in South Africa.
- Louis Leakey
  Leakey's lifelong passion for African prehistory was eventually rewarded with the discoveries of *A. boisei* and *H. habilis*.
- Mary Leakey
  Although she worked for decades with her husband Louis, Mary Leakey is a respected scientist in her own right, responsible for such finds as the Laetoli footprints.
- Richard Leakey
  Leakey has been responsible for the discovery of a wealth of hominid material, such as the fossils ER 1470 and WT 15000 from Kenya.
- Donald Johanson
  Johanson has discovered many important hominid fossils, especially in Ethiopia, the most famous one being the partial skeleton Lucy.

Fossil Hominids: Eugene Dubois

Eugene Dubois was the first person to ever deliberately search for fossils of human ancestors. Only a handful of fossil humans had already been discovered, and those were by chance. In a remarkable story of dedication and luck, Dubois succeeded in his unlikely quest.

Eugene Dubois was born in the town of Eijsden in the Netherlands in 1858. As a boy he was fascinated by natural history, a pursuit encouraged by his pharmacist father. A good student, he studied medicine and graduated as a doctor in 1884. Two years later he was appointed an anatomy lecturer at Amsterdam University, and married in the same year. The following year, he gave it up to go to the Dutch East Indies, now Indonesia, to look for fossils of human ancestors.

No one is quite sure why Dubois threw up a good job to travel half way around the world on what most people would surely have considered a wild goose chase. Obviously, he must have been interested in human evolution. He had also discovered that he disliked his job as an anatomy lecturer, especially his teaching duties. Finally, Dubois apparently felt that his advisor, Max Furbringer, had claimed credit for some of Dubois' own ideas, and Dubois wanted to end their professional relationship. There was little or no merit to this; Furbringer seems to have always behaved correctly and even generously to Dubois. But throughout his life, Dubois seems to have had an almost fanatical fear of other scientists taking credit for his ideas.

He chose the East Indies because, like Darwin and many others, he felt that humans had evolved in the tropics. He believed that humans were closely related to gibbons, which are found in Indonesia. A fossil ape that had been found in India also encouraged him to believe that Asia would be a good place to look for hominid fossils. And, as a Dutchman, a Dutch colony like Indonesia was a convenient place for him to live and work.

Dubois joined the Dutch Army as a medical officer, and he and his wife and baby arrived at the island of Sumatra in December 1887. When he had spare time from his medical duties, he searched for fossils. Early results were promising, and the government assigned him two engineers and 50 forced labourers to help him. But the results were disappointing due to the difficult conditions. The region was densely forested without paths, water was short, one of the engineers was transferred because he was useless and the other one died, and many of his labourers ran away or were sick. Some fossils were found, but they were of fairly recent date.

Dubois decided prospects would be better in Java, and got himself transferred there in 1890. One reason for going there had been a human skull which a mining engineer had found at Wadjak in 1888. Dubois started searching in the same place, and found a second less complete skull. Following this, he started searching in more open areas, especially a site on the banks of the Solo River which proved productive. Once again, he had been assigned two engineers and a crew of convict labourers to help him. (This time the engineers were both competent and managed to stay alive.)

In September 1890, his workers found a human, or human-like, fossil at Koedoeng Broeboes. This consisted of the right side of the chin of a lower jaw and three attached teeth. In August 1891 he found a primate molar tooth. Two months later and one meter away was found an intact skullcap, the fossil which would be known as Java Man. In August 1892, a third primate fossil, an almost complete left thigh bone, was found between 10 and 15 meters away from the skullcap.

In 1894 Dubois published a description of his fossils, naming them *Pithecanthropus erectus*, describing it as neither ape nor human, but something intermediate. In 1895 he returned to Europe to promote the fossil and his interpretation. A couple of scientists enthusiastically endorsed Dubois' work, but most disagreed with his

interpretation. Almost everyone agreed that the femur was effectively indistinguishable from a human femur, but it was widely doubted whether it had, as Dubois claimed, come from the same individual as the skullcap. Some French scientists cautiously accepted that Dubois might be right. German scientists tended to the view that the skullcap was that of a giant ape such as a gibbon, while English scientists tended to view it as a human, coming from either a primitive or a pathological individual, but there were plenty of other opinions. Many scientists pointed out similarities between the Java Man skullcap and Neandertal fossils.

Dubois vigorously defended his interpretation, responding to his critics, providing further information on the fossils, and travelling around western Europe to speak and display the fossils. He pointed out that while many experts considered the skull ape-like and many considered it human-like, this actually strengthened his argument that it was a mixture of both. As time went on, Dubois' position gained more support, although the fossils remained very controversial.

Around 1900 Dubois ceased to discuss Java Man, and hid the fossils in his home while he moved on to other research topics. This may have been to protect his intellectual priority; Dubois had been furious when another scholar had obtained a cast of the skullcap and then proceeded to produce a detailed study which surpassed anything Dubois had done. With Dubois out of the argument and the fossils inaccessible, the controversy died down. In 1897 he was awarded an honorary doctorate in botany and zoology by the University of Amsterdam, and in 1899 became a professor there in crystallography, mineralogy, geology and paleontology. (This was not as impressive as it sounded; he was earning less than he had 10 years earlier as an anatomy lecturer).

Over the next few decades he performed research in a number of areas. In particular, he devoted much effort to understanding the relationship between body weight and brain weight. He eventually came up with a complicated scheme in which all animals had a certain degree of encephalization, which increased in jumps of two (so humans were 1, apes were 1/4, cats and dogs were 1/8, etc.). It was a pioneering approach, but Dubois' results were hopelessly flawed, based on a very small amount of real data and a very large amount of speculation and special pleading. Under this scheme, Java Man, especially if reconstructed with gibbon-like body proportions, had an index of 1/2, which placed it nicely in the gap between apes and humans.

It was not until 1923 that Dubois, under pressure from scientists, once again allowed access to the Java Man fossils. That and the discovery of similar fossils caused it to once again become a topic of debate. The first two Peking Man skulls were found in 1929 and three more in 1936. In the late 1930s, other pithecanthropine fossils were found in Java at Sangiran. It was clear to everyone else that all these fossils were very similar to Dubois' original find, but Dubois fiercely resisted this idea, claiming that they were all human in grade, while his, and only his, fossil filled the gap between humans and apes. In an effort to differentiate Java Man from these later finds, Dubois emphasized the apelike characteristics of his fossil, giving rise to the common myth that he had decided Java Man was just a gibbon, and had abandoned his claim for its intermediate status.

Dubois had officially retired in 1928 but remained scientifically active, and as stubborn as ever, until his death in 1940. In a eulogy, Arthur Keith accurately described him as

> "... an idealist, his ideas being so firmly held that his mind tended to bend facts rather than alter his ideas to fit them."

References

Theunissen B. (1989): Eugene Dubois and the ape-man from Java. Dordrecht,The Netherlands: Kluwer Academic Publishers. (by far the best reference available on Dubois and the early history of Java Man)

Creationist arguments about Java Man

Was Java Man a gibbon?

Did Dubois hide Wadjak Man?

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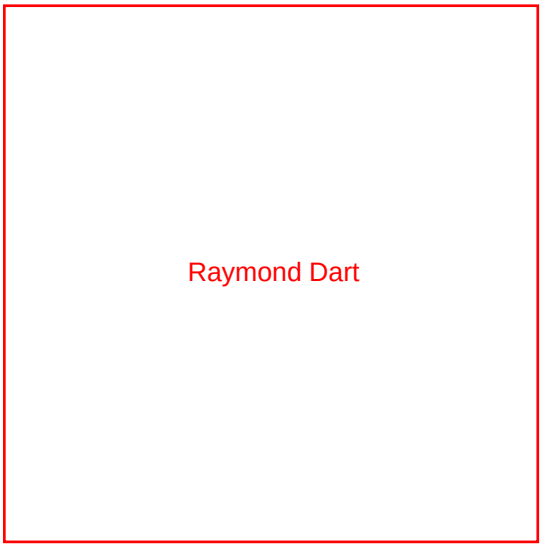
http://www.talkorigins.org/faqs/homs/edubois.html, 06/18/98

Fossil Hominids: Raymond Dart



Raymond Arthur Dart was born in Queensland, Australia, in 1893, the fifth of nine children to parents who lived on a bush farm raising cattle. He won a scholarship to the University of Queensland in Brisbane where he excelled, winning other prizes and scholarships and going on to do medical studies at Sydney. After graduating, he went to England to serve in a medical corps in World War I. As the war ended, he was delighted to be accepted as an assistant by Grafton Elliot Smith, who worked at the University of Manchester and was probably the world's preeminent neuroanatomist (and a fellow Australian who was later knighted). Something in the relationship may not have clicked, because in 1922 Dart was sent off to be professor of anatomy at the newly-founded University of Witwatersrand in Johannesburg, South Africa. Despite Dart's brilliance, he appears to have had a reputation for "flightiness, unorthodoxy and a scorn for accepted opinion". This was hardly a prime opportunity for one of Smith's brightest students. Conditions at the university were appalling, and Dart had to work hard to build the anatomy department from the ground up.

In 1924, Dart learned of a fossil baboon skull that had been found at a nearby limestone quarry at Taung, and asked to be sent any more bones or fossils that were found. The first two crates arrived in November of that year, and Dart found a fossil cast of the inside of a primate skull, which fitted into another lump of stone which possibly contained a face. It took Dart about a month to remove enough stone to reveal the face and jaw of a young fossil primate, which would be nicknamed the Taung baby. Dart considered the fossil intermediate between apes and humans, and quickly wrote a paper for *Nature* which described it and named it *Australopithecus africanus* (Southern ape from Africa). After an initial burst of praise, the scientific establishment in Britain rejected the Taung baby as an ape. At the time, Piltdown Man was widely accepted as a human ancestor, and Taung, with its apelike skull and humanlike teeth, seemed difficult to reconcile with Piltdown's human skull and apelike jaw. Virtually the only supporter of Dart was the Scottish doctor and paleontologist Robert Broom. Dart did travel to London in 1930 to try and win support for his Taung baby, but his find was overshadowed by the recently discovered Peking Man skull. Dart gave up fossil hunting for many years, concentrating instead on his work at the Witwatersrand anatomy department.

In the late 1930s and early 1940s Broom found many more australopithecine fossils in South Africa, and in the late 1940s Dart's position was vindicated when many scientists finally accepted that australopithecines were hominids. In the mid-1940s, Dart once again tried looking for fossils, at the site of Makapansgat. He found a number of fossils which he named *Australopithecus prometheus*, in the mistaken belief that their blackened state indicated the use of fire (in Greek mythology, Prometheus was the Titan who gave humans fire). They are now placed in *A. africanus*. Dart, never one to shy away from extravagant claims, also concluded from his analysis of the site that these creatures had had what he called an "osteodontokeratic" (bone, tooth and horn) culture, and argued that they were savage hunters and bloodthirsty killers whose violent tendencies had left their mark in human behavior. The "killer ape" idea was popularized by writer Robert Ardrey in books such as African Genesis, and is the inspiration behind the opening scene of the movie 2001: A Space Odyssey. These claims were strongly criticized, and later study showed them to be wrong.

Dart lived to see the 60th anniversary of the discovery of the Taung child, and died in 1988 at the age of 95.

References

Dart R.A. (1925): *Australopithecus africanus*: the man-ape of South Africa. Nature, 115:195-9. (announcement of the discovery of the Taung skull)

Trinkaus E. and Shipman P. (1992): The neandertals: changing the image of mankind. New York: Alfred E. Knopf.

Tattersall I. (1995): The fossil trail: how we know what we think we know about human evolution. Oxford,NY:

Oxford University Press.

Raymond Dart, 1893-1988, by Chrissy Duhn

Raymond Dart, with Dennis Craig (1959): Adventures with the Missing Link. (Raymond Dart's autobiography)

Fossil Hominids: Davidson Black

Davidson Black was born in Toronto, Canada, in 1884. As a boy he became an expert canoeist, and while still in school spent his summers carrying supplies long distances by canoe for the Hudson Bay Company. He also befriended Indians and learned their language. Black gained a degree in medical science in 1906, went back to school to study comparative anatomy, and began working as an anatomy instructor in 1909. In 1914 he spent a half-year sabbatical working under the famous neuroanatomist Grafton Elliot Smith in England, which fired an interest in human evolution. In 1919 he was invited to work at the Peking Union Medical College in China, a position he happily accepted because it was then widely thought that humans had originated in central Asia. Black wanted to search for human ancestors, although the PUMC did not approve of this objective and felt that he should be concentrating on his medical duties. While planning an expedition to central Asia in 1926 he learned that two human fossil teeth had been found at Zhoukoudian near Peking, and with the aid of a generous grant from the Rockefeller Foundation, began a large excavation there in 1927.

After finding a further tooth in 1927, Black named it as a new species and genus, *Sinanthropus pekinensis*. Defining a new genus on so little material was a bold move, and many scientists were skeptical of it. (Rightly so, as it turned out, for the species was later reassigned to *Homo erectus*). While Black was travelling in 1928 trying to convince others of its validity, half of a lower jaw was found with three teeth in place. Finally, in 1929, Black got the evidence he was looking for when the first Peking Man skull (Skull III) was discovered. A second skull (Skull II) was also discovered in 1929, but only recognized in 1930. For the next few years, Black worked hard at publishing descriptions of the Peking Man fossils. Although they were very similar to the Java Man fossils found by Eugene Dubois, they confirmed Black's contention that Peking Man had been a pre-human hominid. When Black travelled to Europe in 1930 to present his new evidence, the reception was much more favorable, and 1932 he was elected a Fellow of the Royal Society for his efforts.

Black had a congenital heart defect which was aggravated by overwork. After supper, he often returned to his office to work through the night, returning home early in the morning to sleep to noon. He had been hospitalized for 6 weeks in early 1934, but once released resumed his heavy schedule. In March 1934, he died while working alone during the night, aged only 49.

Unlike most Europeans, Black got on extremely well with his Chinese colleagues, treated them as equals, and was very warmly regarded by them. Walker tells that for many years, on the anniversary of his death, the entire Department of Anatomy and the staff of the Cenozoic Laboratory would visit the European cemetery to leave flowers on his grave.

References

Jia L. and Huang W. (1990): The story of Peking man. Beijing: Foreign Languages Press. (the senior author, Jia Lanpo, has been involved with the Peking Man site since 1931)

Walker A.C. and Shipman P. (1996): The wisdom of the bones. New York: Alfred E. Knopf. (a popular history of *Homo erectus* and the discovery and analysis of the Turkana Boy skeleton)

Dora Hood (1978): Davidson Black: a biography. University of Toronto Press.

Creationist arguments about Peking Man

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http://www.talkorigins.org/faqs/homs/dblack.html, 04/24/98

Fossil Hominids: Robert Broom

Robert Broom was born in Scotland in 1866 to a poor family. Educated as a doctor specializing in midwifery, he used that profession to support himself while travelling the world. Fascinated by the origin of the mammals, he travelled to Australia in 1892. Five years later, he went to South Africa, where he would stay for the rest of his life.

In 1910 Broom's insistence on the theory of evolution cost him his position at the University of Stellenbosch, an extremely conservative religious institution, and he started practicing medicine in the remote Karroo region of South Africa. He also practised paleontology, becoming the world's leading expert on the mammal-like reptiles which were found in abundance in the region. His paleontological work was so highly regarded that in 1920 he was made a Fellow of the Royal Society.

In 1934, aged 68, he gave up his medical practice to take a position at the Transvaal Museum in Pretoria. In 1936 he decided to search for more of Dart's australopithecines, and in the same year found a fragmentary skull of an adult at Sterkfontein (which he initially placed in a new genus, *Plesianthropus*). In 1938, he found the first robust australopithecine skull at Kromdraai after a schoolboy discovered some teeth at the site. Further finds followed, but it was not until Broom published a major monograph on the australopithecines in 1946 and the influential British scientist W. E. Le Gros Clark examined the fossils in 1947 that most scientists finally accepted that the australopithecines were hominids. Other major finds included Sts 5, a superb fossil skull, and Sts 14, a partial skeleton which consisted of much of a pelvis, femur, and vertebral column and proved convincingly that australopithecines had walked upright.

In 1948 he started excavating at Swartkrans, which yielded remains of what was later determined to be *Homo erectus*, as well as further australopithecine fossils.

Somewhat of an eccentric, Broom, conscious of his standing as a medical man, always dressed in a formal dark suit even when fossil hunting, but would strip naked when it got too hot. He remained prodigiously energetic until the end of his life. Broom had promised that he would "wear out, not rust out", and was true to his word. In 1951, after writing the finishing lines of his monograph on the australopithecines, he whispered "Now that's finished ... and so am I". He died moments later at the age of 85.

References

Tattersall I. (1995): The fossil trail: how we know what we think we know about human evolution. Oxford,NY: Oxford University Press.

Wills C. (1993): The runaway brain: the evolution of human uniqueness. New York: Basic Books.

Robert Broom (1950): Finding the Missing Link. London: Watts & Co.

Fossil Hominids: Louis Leakey

Few people have had more impact on the study of human origins than the brilliant, passionate, energetic, eccentric and occasionally erratic Louis Leakey.

Louis Seymour Bazett Leakey was born on August 7, 1903 at Kabete Mission, nine miles from Nairobi, Kenya. His parents, Harry and Mary Leakey, were English missionaries to the Kikuyu tribe, and despite brief stays in England during his childhood, Louis grew up more African than English. He played with Africans, learned to hunt, spoke Kikuyu as fluently as English, and was initiated as a member of the Kikuyu tribe. At 13, after discovering stone tools, he was seized with a passion for prehistory and decided that he would learn about the people who made them. In 1922 he started studies at Cambridge, but a rugby accident the following year left him unable to study, and he left to help manage a paleontological expedition to Africa. He returned in 1925 to resume his studies, and graduated brilliantly in anthropology and archaeology in 1926.

Over the next few years, he conducted a number of excavations in East Africa. He was clearly a rising star, and in 1930 was awarded a Ph.D. for his work. In 1932, he discovered fossils at Kanam and Kanjera and claimed that they were the oldest true ancestors of modern humans. On his return to England, these were widely praised as important finds, and Louis' star rose even higher. In response to some doubts, he invited the geologist Percy Boswell to visit the sites during his next expedition (1934-1935) to Africa. Unfortunately, once Boswell arrived, a combination of inadequate documentation and bad luck meant that Leakey could not reliably identify either site. Back in England, Boswell's report seriously damaged Leakey's scientific reputation.

In 1928 Louis had married Frida Avern, an Englishwoman he had met in Africa. While in England in 1933, he met Mary Nicol, a scientific illustrator, and soon started an affair with her despite the fact that he had one young child and a pregnant wife. Mary joined him for his next expedition to Africa, and returned home to live with him in 1935. In 1936, his wife Frida filed for divorce, and Louis and Mary married late that year. The scandals over his personal life and the Kanam and Kanjera fiascos effectively destroyed Louis' promising academic career at Cambridge. Without a steady job, he got a small income from speaking and writing, and in 1937 he returned to Africa to do a massive ethnological study of the Kikuyu tribe.

During the 2nd World War Louis performed intelligence work, but in between his wartime responsibilities he and Mary continued to do archaeological work. In 1941 he was made an honorary curator of the Coryndon Museum (later the Kenya National Museum), and in 1945 he accepted a poorly paid position as curator of the museum so that he could continue his paleontological and archaeological work in Kenya. In 1947, Louis organized the first Pan-African Congress of Prehistory, a successful event which helped restore his reputation and introduced many scientists to the large amount of important work that the Leakeys had accomplished since the Kanam/Kanjera debacle.

He and Mary continued to excavate at many sites during the 1950s, especially Olduvai Gorge in Tanganyika (now Tanzania). Although the discovery of an important Miocene ape fossil in 1948 had given them some attention and led to more funding, money constraints always limited the amount of work they could do. Nevertheless, they continued to make significant discoveries.

In 1959, Mary found their first significant hominid fossil, a robust skull with huge teeth. It was found in deposits that also contained stone tools and Louis, typically, inflated its importance by claiming it was a human ancestor and calling it *Zinjanthropus boisei*. To everyone else, it seemed markedly unhuman, and most similar to robust australopithecines. Even so, it was a major find that gave them tremendous publicity. The National Geographic magazine printed the first of many articles about the Leakeys and their finds, and gave a large amount of funding which allowed the Leakeys to greatly increase the scope of their excavations at Olduvai. Within a few years they had found many more hominid fossils, including some that were far more plausible human ancestors and toolmakers than Zinj. In 1964, Louis, along with Phillip Tobias and John Napier, named the new species *Homo habilis*. Although originally controversial, *habilis* would eventually be widely accepted as a species.

Through the 1950s, Louis and Mary's marriage suffered, mostly from Louis' philandering, but they stayed together, mostly because of their children. In the 1960s, Mary continued to concentrate on Olduvai Gorge, while Louis flitted between many other projects. Most notably, he was responsible for initiating Jane Goodall's decades-long field study of chimpanzees in the wild, and the similar projects of Dian Fossey (for gorillas) and Birute Galdikas (for orang-utans). He was also involved with a primate research center, excavations in Ethiopia, and a search for ancient humans at Calico Hills in California (this last was considered almost a crackpot idea by

most scientists), among others. In addition he was doing a lot of travelling, speaking, and fund-raising, much of it in America where he was tremendously popular. On top of everything, his health was rapidly failing, and he was plagued with serious medical problems. He collapsed and died in England in October 1972, aged 69.

A few days before his death, his son Richard had shown him the just-discovered fossil skull ER 1470, which seemed to support Louis' long-held contention that the genus *Homo* had a long history and had not descended from australopithecines. It also led to a reconciliation between Louis and Richard, who had been clashing personally and professionally for some years. Louis' last few years had been very difficult, but these developments must, at least, have brightened his final days.

References

Leakey L.S.B. (1974): By the evidence: memoirs, 1932-1951. New York: Harcourt Brace Jovanovitch.

Morell V. (1995): Ancestral passions: the Leakey family and the quest for humankind's beginnings. New York: Simon & Schuster.

Other sources

Sonia Cole (1975): Leakey's Luck. London: Collins.

Louis Leakey (1937): White African. London: Hodder & Stoughton.

Discovering the Secrets of Humankind's Past, by Ted Weiman

Fossil Hominids: Mary Leakey

Mary Douglas Nicol was born on February 6, 1913. Her father, Erskine Nicol, was a popular landscape artist, and Mary spent much of her childhood in Europe, especially in the Dordogne and at Les Eyzies, a region rich in prehistoric art and archaeological sites, topics in which Mary became interested. Her idyllic life was shattered in 1926 when her father, to whom she was exceptionally close, died, and Mary and her mother moved back to London. Attempts to give her some conventional education failed when the rebellious girl was expelled from two Catholic schools. In 1930 she began auditing archaeology and geology university courses, and she worked on archaeological digs and as a scientific illustrator. She met Louis Leakey in 1933 at Cambridge, and soon began an affair with him. On his next expedition to Africa, she arranged to meet him there, travelled home with him, and soon moved in with him. After his wife Frida divorced him, they were married in late 1936. She returned to Kenya with Louis the following year, and in the subsequent decades worked in many excavations. An important discovery of Mary's was the first fossil skull of the extinct Miocene primate *Proconsul*. Mary primarily worked as an archeologist rather than a physical anthropologist.

In 1959, Mary found the "Zinjanthropus" (*Australopithecus boisei*) fossil which was to propel the Leakey family to worldwide fame. From the mid-1960's, she lived almost full time at Olduvai Gorge, often alone, while Louis worked on other projects. She and Louis grew apart, partly because of his womanizing and partly because Louis was dividing his time between many other projects. In 1974, she commenced excavations at nearby Laetoli, and in 1976 her team found huge numbers of animal footprints that had been fossilized in ash deposited by a volcano. In 1978 they found what would be her greatest discovery, adjacent footprint tracks that had been left by two bipedal hominids.

In 1983, Mary retired from active fieldwork, moving to Nairobi from Olduvai Gorge, where she had lived for nearly 20 years. She died in 1996 at the age of eighty-three. Although it was Louis Leakey who was the more charismatic and well-known figure, Mary became a famous scientist in her own right. Although she had never earned a degree, by the end of her life she had received many honorary degrees and other awards. It is generally agreed that Mary was a better scientist, far more meticulous and cautious than the often reckless Louis. Her prodigious achievements in archaeology make her a giant in the field.

References

Leakey M.D. (1984): Disclosing the past. New York: Doubleday. (Mary Leakey's autobiography)

Morell V. (1995): Ancestral passions: the Leakey family and the quest for humankind's beginnings. New York: Simon & Schuster.

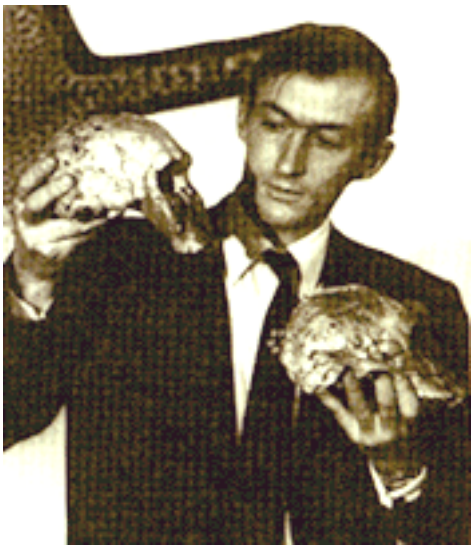
Biography of Mary Leakey

Mary Leakey: Unearthing History (a Scientific American interview)

Mary Leakey Dies at Age 83

Mary Leakey, fossil hunter

Fossil Hominids: Richard Leakey



Richard Erskine Leakey was born on December 19, 1944, the second of Louis and Mary Leakey's three sons. At an early age, he decided he wanted nothing to do with paleoanthropology, and later dropped out of high school. In the next few years, he trapped wild animals, supplied skeletons to institutions, started a safari business (observing animals, not killing them), and taught himself to fly. In 1964, he led an expedition to a fossil site he had seen from the air and discovered that he enjoyed looking for fossils. He also discovered, to his dismay, that although he had technically led the expedition, all the glory went to the scientists who studied the specimens. So in 1965, he went to England to study for a degree. He spent 6 months catching up on two years of missed high school then returned home to resume his safaris, work at the National Museum of Kenya, and managing paleontological expeditions (he never did return to get his degree). In 1966 he married an archaeologist, Margaret Cropper, who had worked with the Leakey family.

After working on a French/Kenyan/American joint expedition to Omo in Ethiopia, Richard realized once again that his lack of scientific qualifications hindered his progress, so he asked the National Geographic Society for funds to run his own excavation at a site he had found near Lake Rudolf (now Lake Turkana) in Kenya. In 1968, nimble political manoeuvering led to him being appointed as the director of the National Museum of Kenya, and he commenced fossil hunting at Rudolf. The expedition was successful, finding large numbers of fossils, including hominids. The excavations continued in subsequent years, producing a steady stream of hominid fossils that dazzled the scientific world. Most spectacular were the fossils ER 1470, a *Homo habilis* skull found in 1972, and ER 3733, a *Homo erectus* skull found in 1975.

In 1969, he and his wife Margaret had a daughter, Anna, and they were divorced in the same year. The following year he married Meave Epps, a zoologist who specialized in primates. They have had two daughters, Louise in 1972, and Samira in 1974.

In 1969 he had been diagnosed with a terminal kidney disease, with a prognosis that he probably had less than 10 years to live. The condition worsened slowly, but by mid-1979 it was serious enough that Richard went to a kidney specialist in London. He was in end-stage renal failure, and would die unless he received a kidney transplant or was put on dialysis. In November he received a kidney transplant from his younger brother Philip, but a month later it started to be rejected. Drugs suppressed the rejection but weakened his immune system, and he almost died from pneumonia and pleurisy. He (and the kidney) recovered fully, and he returned to Kenya after eight months in England (during this period, he had written his autobiography *One Life*).

Fossil hunting expeditions continued, although on a smaller scale than in the 1970s, as Richard devoted more of his time to running Kenya's museum system. In 1984 his team found the most impressive fossil of his (or, arguably, anyone else's) career. WT 15000, nicknamed the Turkana Boy, is the nearly complete skeleton of a *Homo erectus* boy. The following year supplied another major find, WT 17000, the first skull of the species *Australopithecus aethiopicus*.

In recent years, Richard has had little to do with paleoanthropology, although he remains interested in the field. He took up conservation issues and, from 1989 to1994, directed the Kenya Wildlife Service, where he was successful in combatting elephant and rhino poaching and overhauling Kenya's troubled park system. Political opposition caused him to resign from that position, and he started up a wildlife consultancy agency. Since then he has become involved in Kenyan politics, and is Secretary General of the Kenyan opposition party Safina. In December 1997, he was elected to an opposition seat in the Kenyan parliament.

In 1993, a crash caused by a malfunction in the airplane he was flying caused the loss of both legs below the knee.

Richard's wife Meave continues to work in paleoanthropology. In 1995, she and her team described a new hominid species, *Australopithecus anamensis*. She may not be the last of the Leakey dynasty; their daughter Louise has managed her own paleontological digs and in 1995 graduated with an honors degree in geology and zoology,

References

Leakey R.E. (1984): One Life: an autobiography. Salem, NH: Salem House.

Morell V. (1995): Ancestral passions: the Leakey family and the quest for humankind's beginnings. New York: Simon & Schuster.

Richard Leakey: Africa's passionate voice for Nature

A review of Origins Reconsidered

Meave Leakey - Biography

Fossil Hominids: Donald Johanson

Donald Johanson was born in Chicago in 1943, the son of Swedish immigrants. His father died when he was two, and his mother moved to Hartford, Connecticut, where he developed an interest in anthropology from a neighbour who taught the subject. Although he initially studied chemistry at university, he eventually switched majors to anthropology, and worked during summers on archeological digs. He transferred to Chicago to study under F. Clark Howell for his graduate studies, doing a comprehensive study on chimpanzee dentition for his doctoral thesis. In 1970 and 1971 he visited Africa to do field work at Omo in Ethiopia. In 1972, he and some colleagues went on a short exploratory expedition evaluate the Afar Triangle region of Ethiopia. They were impressed by its promise, and planned a full scale expedition the following year. Back in the USA, Johanson completed his Ph.D. and started a teaching position at Case Western Reserve University.

In 1973 he discovered AL 129-1, a small but humanlike knee, and the first knee known from the hominid fossil record. The following year, Johanson and Tom Gray discovered an even more spectacular find, AL 288-1, a partial skeleton of a female australopithecine better known by its nickname of Lucy. In 1975 there was yet another major find when his team found a collection of fossils at a single site which was nicknamed the First Family. In 1976, more hominid fossils were discovered, along with stone tools which, at 2.5 million years, were the oldest in the world. After 1976, political conditions in Ethiopia prevented further expeditions for nearly 15 years.

Johanson, who in 1974 had become a curator at the Cleveland Museum of Natural History, now tackled the task of analyzing the fossils with the aid of Tim White, a young but highly regarded scientist who had just finished his Ph.D. Johanson had originally been of the opinion that the Hadar fossils were a mixture of *Homo* and *Australopithecus* specimens, but White eventually convinced him that all of them belonged to just one species. In 1978 they named that species *Australopithecus afarensis*.

In 1981, Johanson founded the Institute of Human Origins, a non-profit research institution devoted to the study of prehistory. In 1987, the IHO was given permission to conduct an expedition to Olduvai Gorge in Tanzania, and found a partial skeleton, OH 62, which is generally attributed to *Homo habilis*. Since 1990, IHO has recommenced excavations in Ethiopia and have found more *A. afarensis* fossils. The most important so far is a fossil skull, AL 444-2. In 1997, the IHO moved from Berkeley to Arizona and became affiliated with Arizona State University.

References

Johanson D.C. and Edey M.A. (1981): Lucy: the beginnings of humankind. New York: Simon and Schuster. (a short history of paleoanthropology, and the discovery and analysis of *Australopithecus afarensis*)

Johanson D.C. and Shreeve J. (1989): Lucy's child: the discovery of a human ancestor. New York: Early Man Publishing, Inc.

Interview with Donald Johanson

Annonline material about Donald Johanson

Institute for Human Origins

In Search of Human Origins, Part I (Part II, Part III), with Don Johanson

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Fossil Hominids: What's New?

This website will continue to be developed. I plan to update it at least twice every year. The links page gets updated more or less continually, and changes to it are not listed here. Come back in a few months time to see what's new!

See also the Recent developments page for news of the latest developments in paleoanthropology.

July 10, 1999
Added a page on the skeleton discovered at Lagar Velho in Portugal.
Added information on the new species *Australopithecus garhi*.
Added a page listing creationist resources on human evolution.
Added a review by Colin Groves of Jack Cuozzo's book Buried Alive.
Added a review of Jeffrey Goodman's book The Genesis Mystery.

March 30, 1999
Added a response to Bowden's claims about the missing Peking Man skeletons.
Added a comparison of a cast of the Java Man skullcap with a gibbon skull.

October 30, 1998
Added a review of the Jack Chick tract Big Daddy?
Added an article about the human evolution exhibit at the American Museum of Natural History.
Added a comparison of a cast of a Peking Man skulls with a monkey skull.

July 31, 1998:
Added online discussions with Ted Holden and Ed Conrad.
Added a response to a creationist web page by Jon Scott.

April 28, 1998:
Added a page of paleoanthropological humor.
Added a page of links to crackpot theories about human evolution.
Added a page about Duane Gish and Wadjak Man.
Added a page listing type specimens for hominid species.
Added a page of biographies of scientists.

Feb 3, 1998:
I added a Debates section to the Creationist Arguments page, containing online debates with Richard Milton and Karl Crawford.

Nov 11, 1997:
Added a page about popular representations of Neandertals.
Discussed claims about a Neandertal discovered with chain mail armor.
Is it spelt Neanderthal or Neandertal?
Updated the Orce Man page.
Added a page on Semicircular canals.
Added a page on the novel Operation Adam.
Added info on a creationist mistranslation about Peking Man.

April 28, 1997: Version 6 of the FAQ released
Most of the pages have changed at least somewhat, but here are the major differences.
Added a page of paleoanthropological fiction.
Added a page on creationist misquotes about the human fossil record.
Added a page on Orce Man, a Spanish fossil discussed by Duane Gish.
Added new information about Nebraska Man, along with some illustrations.
Added responses to creationist web pages by Walter Brown and Darren Gordon.

There is new data on KP 271, a 4 million year old fossil that creationists claim is human.
Expanded the section on the 2 million year old stone circle found at Olduvai Gorge.
Expanded the section on the Kow Swamp skulls, added a page on why the Kow Swamp skulls are not *H. erectus*.

October 1996: I took pity on those using modems, and broke the FAQ into smaller pages, with navigation links at the bottom of every page. Also added a Feedback page.

Apr 16, 1996: Version 5 of the FAQ released (151K)
Expanded sections on *Homo erectus*, Anomalous fossils.
Expanded section on Peking Man to cover claims of Malcolm Bowden.

Nov 14, 1995: Version 4 of the FAQ released (131K)
Converted to HTML, added many illustrations.
Added sections on Lubenow's book Bones of Contention, and hominid brain sizes.
Added data on *Australopithecus anamensis*.
Expanded section on Java Man.

May 16, 1995: Version 3 of the FAQ released (89K)
Major additions to the sections on Homo habilis, Peking Man.
Added sections on recent developments, and an overview of creationist arguments.

Jan 19, 1995: Version 2 of the FAQ released (59K)
Corrections and minor additions to version 1.

Nov 11, 1994: Version 1 of the FAQ released (53K)

This page is part of the Fossil Hominids FAQ at the talk.origins Archive.

Home Page | Species | Fossils | Creationism | Reading | References
Illustrations | What's New | Feedback | Misquotes | Links | Fiction

http://www.talkorigins.org/faqs/homs/whatsnew.html, 03/10/99

Fossil Hominids: Feedback

I have received many letters thanking me for the Fossil Hominids pages, some of which are printed below. They are much appreciated; it is a pleasure to know that the FAQ is being used, particularly by teachers in both universities and schools. (I can be contacted at habilis@talkorigins.org).

And, of course, I also get some negative feedback, which I have included near the bottom of this page.

> From the Netwatch column in the Nov. 20, 1998 issue of Science, one of the world's most prestigious scientific journals:
>
> Part of a site that counters creationist claims, Fossil Hominids reviews the evidence on questions such as whether Peking Man was an ape and the significance of human brain size. The wealth of information here includes background on key fossils, drawings and photos, scientists' biographies, references, and lots of paleoanthropology links.

> Thank you so much for the excellent site on the recent developments in paleoanthropology. I found everything I needed for my biology class in one area!

> I just want to say, this has got to be the best internet page I've ever visited. Thanks for making revision and essay writing so interesting.Now could you encourage the Biochemistry department to do the same???
> Laura Menez

> Great page!! I teach a large section of undergraduate majors here at UF and I used your page as a ref for the class.
> Mike Moulton

> I am writing a paper for an evolution class in which I am currently enrolled. Your website has helped me a lot. I have learned more from your site than I have from the textbook I purchased for class. I will get a great grade on my paper, and it's all thanks to you!
> Kara Zylstra

> I would like to take a moment to express my thanks. I am a middle school science teacher tackling the teaching of evolution. I find my students often know more than I do, or at least they try to ask the most obscure questions. Your website has helped me more than I can say.
> Thank you again,
> Carrie Arnett

> Many thanks for this terrific site. Human origins is a lifelong interest of mine, and I have been interested in "creation science" (so-called) for years as well. I particularly enjoyed your information about recent discoveries and taxonomic theories. Interesting links also. Again, thanks very much.
>
> John B.

> I would like to thank you for this website. It has enabled me to allow my students to see the "larger" picture of human evolution. Continue the good work

---

> THANK YOU!!!!!! I've needed someplace to point people who ask about the creationists' ridiculous claims and I don't always have the time to go into detail with each of them. I'm still waiting for the moment when they begin to demand that we teach Magic 101 as a counter for

Electromagnetic Theory. Scary thing is, they're really, really good at making their idiocies sound like something democratic -- well, at least, until someone suggests also teaching the creation myths of the Hopi or the !Kung.
Frank Mosca

Thank you for this great article! I'm a freshman in high school and in my Biology class we are studying evolution. I needed to do a project on how Physical Anthropology supports Evolution. After surfing the web for an hour and a half, I was about to give up, but then I stumbled on your site and it saved the day! It provided me with the appropriate info I needed. Thank you soooo much!

Jacki

From the October 97 issue of Natural History, the magazine of the American Museum of Natural History: Two related sites worth looking at are: ...; and Paleoanthropology Fiction (www.talkorigins.org/faqs/homs/fiction.html) which has reviews of books that bring our most ancient ancestors to life with varying degrees of scientific accuracy.

I'm not one to usually send "fan mail", being a News lurker.
However, I'd like to express my admiration for the work you've done in this page.
I imagine a great deal of effort had to go into the collating of the responses to creationist errors of fact or omission.
The web does have its high points, and your page is one of them.

Keith Cohen

---

brilliant! Give this person a knighthood. Or money. Or both.

Laurie

Thanks for taking the trouble to develop the Talk.origins archive site. My daughter's biology teacher is trying to impose creationism as an acceptable alternative to evolution. Now we have some ammunition to counter her arguments.

David Forbes

---

this is a fantastic web site for the begining anthropologist. it was a great help to me. i learned more from browsing your site than i learned in more than half of a semister in my anthropology class in college. thanks again for having such a great site. keep up the good work.

What a great site. I'm sure I will make it a resource in the future. It's great to have real information to refer to when the need arises. Please accept my personal thanks for this great work.

Odin Maxwell

Dear Jim,

Your FAQ is really useful. Students have been using it; I pointed some in that direction, others have discovered it for themselves. It's as good as your average textbook, and much more succinct of course. I recommended it at a recent science teachers' meeting that I addressed, and so did Richard Allan (author of the schools text, "Human Origins").

I haven't been speaking to any creationists lately, but rest assured I will recommend it to them as well. It will at any rate force them to admit that their views are based on thin air alone...

Colin Groves
Reader in Biological Anthropology
Department of Archeology and Anthropology
Australian National University

Hi Jim!

Now that classes are over for the summer I finally got a chance to look over your Fossil Hominids FAQ. You've done an extraordinary job of organizing and simplifying the mass of data and theory on the subject. My hat's off to you - I could not have done it so well myself.

I wonder, had you known how much work this would be at the beginning, whether you would have undertaken such a vast project. It's a tribute to your character and intellect that you persevered. I will definitely point my Human Evolution students toward it as an excellent study resource, and probably refer to it often myself.

Thanks! Your efforts are deeply appreciated.

Randy Skelton
(Randy is a physical anthropologist at the University of Montana, with some major published papers on hominid taxonomy)

Dr. Foley:
This page has provided me with the most lucid discussion of the current thinking in human evolution I have ever seen. Thanks!
I have been trained as a mammalian physiologist and, like so many others I also teach general education biology in order to have a teaching schedule. Since evolution is the unifying concept in Biology, I teach evolution, saying the word frequently throughout the course. Debating creationists (ie closed minds) is a singularly unrewarding pastime. In any event I would like your permission to distribute portions of your material to my students. [etc.]

Tom Miller
Assistant Professor
Miami-Dade Community College - North Campus

Mr. Foley,
I'm writing to express my appreciation for your fossil Hominids FAQ. I'm a cultural anthropologist in a small department in the US and have been teaching a one semester course on Human Evolution: Cultural and Biological for many years. In addition to suggesting your FAQ to my students and to a colleague in Biology who teaches a course on evolution and creationism, I've used your list and description of the individual fossils as the basis for a data base on hominid fossils. I had been planning the daunting task of developing one on my own this summer, but finding your excellent descriptions (complete with citations) was a real help.

Best wishes,

James Stuart
Professor of Anthropology
University of Illinois at Springfield

Many, many thanks for putting up this page. I use this material extensively in Human Ecology and always get questions regarding recent finds. You have made life much more easy! Your refutation of the creationist arguments is superb.

Regards,

Stephen Ervin, Ph.D.
Department of Biology

California State University, Fresno

Wow! This is a wonderful page! You have done a marvelous job abstracting the information available, and your reference list is really wonderful. With your permission, I would like to provide a link from my Historical Geology class Web page to your page-my students would greatly benefit from your work. Thanks for both your time and your efforts.

Larry McKenna (LMcKenna@kuhub.cc.ukans.edu)
Asst. Prof. Geology
University of Kansas

From a later message:

BTW, the kids really enjoyed your site. The anthropologists in particular were bonkers over it.

Hello:
I am a third semester student of Geology in EAFIT University here in Medellin(Colombia).
This semester I studied Paleontology, and for the final work of the course I had to make an investigation related to anthropology, specifically the origins of man.
I looked in every bibliography here in different universities, and also on the INTERNET, and here is where I found your excellent and complete page. I used many of the information that you have on your page and it worked pretty well on my final written work.
So this mail is just for saying
THANK YOU VERY MUCH
And I hope to be visiting your page again, because the theme interested me a lot.

Good Luck!
Pablo Antonio Castro Lopez
Geologia EAFIT

Thank you for your FAQs covering the fossil hominids. I have been cursed with a professor for my introductory anthropology and archeology course who is unable to deliver a decent lecture. Not only will your material help me finish my degree on time, but it will also clear up a number of problems that I have encountered as a result of my professor's many digressions. Once again, thanks for the FAQs; they have been a real life saver.

[Name omitted, for obvious reasons]

Thanks for the great web page! I have to give a presentation on hominid skulls and cranial capacity next week and you've just provided me w/ some of the most up-to-date info available.

[Anonymous]

Dear Jim

My 7th form Biology class (ages 17-18) have been sponsored by the NZ Ministry of Education to access the internet for research.

Your information on fossil hominids is an oustanding resource. Approximately 20% of our course is based on a detailed study of human evolution.

Thank you for making this up to date, relevant material available.

Kind regards

David J. Day (david@piopio.school.nz)
Deputy Principal (and Biology teacher)

Piopio College, New Zealand

Jim,
As a "net novice" I am not at all qualified to adequately thank you for your Origins Archive. As a high school Anthro teacher I can't thank you enough. The up to date nature of your info and the wonderfully useful graphics will surely find their way into my classroom. Keep up the great work.

Richard Secare
Dumont High School
Dumont NJ USA

Nice job on the site. It is much appreciated. I have recommended it my classes at the University of Great Falls, Great Falls, Montana. I teach an introductory class in Human Origins.

Al Johnson Ph.D.
Associate Professor

Hi Mr. Foley,

This is a quick note of thanks to you for the web pages on the fossil record. Until recently I was a creationist, believing the earth to be 10,000 years old.

Since subcribing to the internet and finding the talk.origins FAQ pages I am becoming convinced that I am wrong, firstly with the age of the earth and now with the subject of evolution. It's difficult to come to these kind of conclusions quickly, as there is so much information from so many different fields to take in, but one of the factors persuading me is how poor the creationists are at presenting a case. I can only conclude that there isn't one.

Thanks again.
Steve.

From a later message:

... I'm fully convinced now of the common descent of species, and of the 4.54bn year age of the earth. Certainly, your web pages were a big help in showing me how strong the evidence is for the common descent of apes and Homo sapiens.

Jim,
I just want to tell you how much I appreciate the TalkOrigins Archive on the web. My training is in classical archaeology, but I teach a general introduction to archaeology which covers the long haul of human history. The information and links provided in the Archive have been invaluable -- both to me in developing presentation and discussions on human origins and to students who are increasingly using the web to do research.

... I am using the materials on the creationists' criticisms of evolution in my class right now. They are a terrific help.

Mary Lewis
Professor of History and Archaeology
Kean College of N.J.

I'd just like to say that your site is really great!! I'm in 7th grade and we're studying Java Man, Peking Man, and Homo erectus in general, and I wanted some extra credit points. So, I checked on Webcrawler and found just what I was looking for: your site!!!! I printed out some great illustrations of skulls, and a picture of Lucy's bones (we looked into her background a little). So, keep up the good work!

Kim

To Mr Foley
I am a grade 7 student and for school I have to do a report on Homo Habilis, H. erectus, Neandrathal and Cro-magnon man your page helped a lot so I thought I would say thanks.....Thanks Julia C.

Jim,
Thanks for the fossil hominid information in these pages. I teach intro at [name deleted] Community College, and the book ordered by the college has zero information on the subject

While I am teaching from Nelson&Jurmain, my students have only copied handouts as supplementary material. I will have them all go to your web site for further information.

It is very well done and appreciated. I especially like the creationism sections, as I am here in the belly of the beast where they hand out Bibles in middle school.

Don

I found your web site looking for some information about A. ramidus. I really like what you have done here -- taking the trouble to read through and comment on the Creationist arguments. I don't have the patience for this myself, and am glad that you have. I will refer my students to your site.

M. A. Clark
Professor of Biology
Texas Wesleyan University

Dear Mr. Foley

Thank-you for the obvious effort you have put into this site. I teach biology at a secondary school in Illinois. Thank-you for so clearly presenting the human fossil evidence. As our students have just received internet access at school, I will be including your site as a web site they should visit during our study of evolution.

Well done!

Pamela S. Duncan
Mundelein High School
Mundelein Illinois

I've accessed your web page several times, and I think you've done a great job. I'm currently doing work on some trophy heads at Chicago's Field Museum, and I've often been asked questions with regard to topics that you have listed. Great job!

Kathleen F.

Mr. Foley,
I am a first year University of Kentucky student assigned to do a paper on the evolution of humans. I did not have enough information to even start a paper on this because all of the articles I looked up, I could not understand because of their complexity. I just wanted to say thank you so much for having such a great website with easy to read and understand information. You have been a great help and I appreciate it very much!! Thanks again!

Dear Mr. Foley,
I wanted to express my deep appreciation and admiration for your wonderful hominid article that I

found in "infoseek" on the web. My only suggestion would be to castigate the creationists more severely than you did.
Thanks again, sir -- R. C. Jones

I have also received a few responses from creationists, most of which follow.

Mr. Foley,
I was browsing through your webpage, and I stumbled upon the feedback page. As I was reading through some of the comments by obviously Christian (and angry) respondents, I couldn't help but cringe at some of the things they were saying.
I am also a very conservative Reformed Christian, and have a great deal of interest in the creation/evolution controversy, enough so to have devoted one of my majors to it as an undergrad at UofM, Anthropology-Zoology, with an emphasis on hominid origins (taking classwork from none other than Wolpoff and Caspari themselves). I do not agree with many things contained within Talk.Origins, but I am greatly appreciative that someone has taken the time to catalogue such a vast array of arguments, counterarguments, and evidence for the evolutionary perspective. I have visited the site many, many times (especially to find material for some of my classes), and have referred many of my more skeptical brethren to it.
It does shame me and Christianity in general that these people are so PRIDEFUL, so vehement and so full of what they believe is righteous anger when they write these comments. I do not know what your impression of Christians is in general, but I hope that whoever has read the comments does not conclude that all Christians are so narrow-minded.

Thanks for reading,
Wei.

Jim, I first must say I enjoy your site. It is professionally made and unlike other so-called "skeptic" sites trying to show the strengths of evolution, you take your evidence to science investigation and what you believe the data says on the subject. Even though I am a CREATIONIST, I found your site very thought provoking and enjoyable. Even though it can be difficult, it seemed to me you tried to stay away from attacks to creationist as people and their faith. I will visit your site often. However, I want to challenge you to not attack creationist (Gish, others on fossil debates) as to disagreements on fossils. After all, many macro-evolutionist disagree on fossil evidence all the time. Thank you, Ken

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This site must havve taken a long time to build. I suppose you don't realize how much nonsense is contained in this page and how much wasted time it must have taken. You can try to back up your theories and stuff with what you call "proven evidence." You do not have one true piece of evidence for evolutionism, while I have the Bible to back up every word of creationism. I am a 14 year old boy, and I have been assured that I am going to heaven. When you die, God won't be laughing in your face because you didn't believe in him. He'll be sorry that you missed it.

Andrew

You have certainly devoted a significant amount of time and energy to your attempts at rationalization. I always find it humorous when evolutionists, when they find themselves without foundation, resort to such scientific statements as "creationism is crap". Some try to explain their faulty reasoning by changing the definition of evolution and others say we didn't understand what they meant. You appear to have amassed almost every attempt at refuting what is becoming more clearly the only possible answer. It's too bad you have a forum with which to make false statements purporting that the scientific community believes as you do. The fact will regardless, remain that we do not. I trust you will be willing to work to communicate the truth with the same zeal when you finally realize your errors.

Ric E.

The leaps in logic amaze me with the evolutionist therories. How can you say one fossil is "ape"

one is "human" and the other is somewhere in between? There is no irrefutable proof that man evolved fron ape. A person can not even tell the difference between a skinned rabbit minus its head and feet and a skinned cat minus its head and feet. Here in the Northwest when a body was found near the Green River, skinned and missing its head, hands and feet, it was assumed to be another victim of the "Green River Killer." After extensive examination by the coroner it was found to be the body of a small black bear. If it is so difficult to tell the difference between a rabbit and a cat and a human and a bear, something that we all are familiar with, how can you take that giant step to except evolution as fact? How can you even be sure if evolution is true that it took millions of years to acomplish when mice that have been exposed to the radiation of Chernobyl have mutated to the extent that the are more genetically different to unexposed mice than rats are to mice? An evolutionary split that allegedly took place millions of years ago. The Bible has been ahead of science through out history. Science is the one that is always playing catch up not religion. If you would spend half the time even a tenth of the time you spend chasing the evolutionary theory studing the Bible you would see the truth. I know because I was where you were at one time.

Dale

I can respect your diligence to constantly try to prove the origins of man. You have, though, job security. As long as man does not want to beleive in God he will try to prove there is no God. And there are those who will try to prove God. It basically comes down to faith. Faith of Evolution or Creation. I was once told "Without controversy there would be no growth." We have controversy but this one is like playing with fire. Eventually someone will get burned. Enough of that.
I am currently studying creationism. After all evolution has been crammed in my head for years by secondary teachers and college professors. I would just like to know how something that can not be scientifically proven is being taught to people as fact.
I have seen scientists prove that the world can not be more than 10,000 years old. They have not proven it's any younger but have definitely proven how oil, mountains, canyons and other geograghical locations were formed or made in possibly days, weeks or months. They have also proven coal and fossils may have developed in just a few thousand years or less. Your job is still interesting and I beleive there is a future for professionals like you. Except you will have to just shorten your dates a little and realize that it really is skulls and bones of the monkey-ape species you are digging up. With proof the world is at most 10,000 years old there is no way man came from monkey, like there ever was a chance in 4 million years.
I'll send some names of the scientists and thier information soon.

Thanks, Chris B.

Before you can say that creation doesn't make any sense, take a closer look at the thousands of contradicting theories of evolution. Not one iota of evidence exists which proves evolution. In fact, I have honestly found more scientific evidence that supports a theory of creation than the theory of evolution.

Heidi A.

ANYONE WHO BELIEVES EVOLUTION NEEDS MORE FAITH THAN A CHRISTIAN DOES TO BELIEVE CREATION. I SAY THIS BECAUSE THERE HAS YET TO BE ONE SOLID PIECE OF EVIIDENCE TO SUPPORT EVOLUTION. DIRECT OBSERVATION OF THINGS LIKE-THE MAGNETIC FIELD EROSION RATES, POLYSTRATE FOSSILS, SOLAR DIAMETER, CHANGES IN ATMOSPHERIC PRESSURE AND CONTENT EXTINCTION RATES VS NEW SPECIES APPEARING YOU WOULD SEE YOUR FOLLY. ALL OBSERVABLE EVIDENCE SUGGESTS A UNIVERSE NO MRE THAT 10,000 YEARS OLD.

I note the following not to argue, but to observe that there is a wealth of comment among evolutionists replete with concern over the paucity of evidence lacking in support of the philosophy of evolution.

It is of interest that such a scientist as Dr. Fred Hoyle, a Nobel prize laureate, says that there is as

much likelihood of evolution happening as there is of a tornado producing a Boeing 747 in a junkyard... ("Hoyle on Evolution", Nature, vol. 294, Nov.1981, p.105.)

...or Dr. Lyall Watson ("The Water People", Science Digest, vol. 90, May 1982, p.44) saying "The fossils that decorate our family tree are so scarce that there are still more scientists than specimens. The remarkable fact is that all the physical evidence we have for human evolution can still be placed, with room to spare, inside a single coffin!"

...or Lord Dr. Solly Zuckerman (anatomy, and forensics I believe) who said in "Beyond the Ivory Tower" p.64, "As I have already implied, students of fossil primates have not been distinguished for caution when working within the logical constraints of their subject. The record is so astonishing that it is legitimate to ask whether much science is yet to be found in this field at all."

I used to believe the whole evolution thing completely, until I started, as thousands of scientists have done, to examine it all according to true scientific method.

Craig

TIM FOLEY,

WHEN WILL EVOLUTIONIST EVER PRODUCE A SINGLE TRANSITIONAL FORM? THERE HAVE BEEN MILLIONS OF FOSSILS DISCOVERED BUT NEVER A SINGLE TRANSITIONAL FORM. TO PUSH SUCH A THEORY AS EVOLUTION DOWN THE THROATS OF THE PEOPLE, YOU WOULD THINK THAT YOU MIGHT HAVE ONE SHREAD OF EVIDENCE SUCH AS A TRANSITIONAL FORM. ONE LIFE TO LIVE SO YOU HAD BETTER BE RIGHT!!

Your arguments remind me of the famous quote, "Don't bother me with the facts, my mind is already made up". If you discount the existence of God, I purposely don't use the terms "Higher" or "Intelligent Being", you are left with no choice but to explain man's existence purely by chance. Something that leaves one with many unanswered questions. Such as: Did the males of a given species evolve into the males of the next species, and likewise for the females? Or did the male and female of the species evolve into a uni sex hybrid then evolve into the next higher level only then to branch into male and female again? Thus far I have yet to find even the most intelligent of evolutionist provide anything resembling an intelligent answer to the question. Maybe you are the exception?

I will pray for you.

I DON'T KNOW WHY YOU INSIST THAT THERE ARE FACTS TO PROVE EVOLUTION. IT IS IMPOSSIBLE TO PROVE SCIENTIFICALLY ANY THEORY OF ORIGINS BECAUSE IT IS IMPOSSIBLE TO CONDUCT EXPERIMENTS ON THE ORIGIN OF THE UNIVERSE. BOTH EVOLUTIN AND CREATION ARE RELIGONS WHICH REQUIRE FAITH. MORE SO FOR EVOULTIONISTS BECAUSE OF ALL THE EVIDENCE THERE IS THAT GOES ALONG WITH CREATIONISM.
IF PROBABILITY CALCULATIONS AND OTHER CONSIDERATIONS PROVE CHRISTIAN CREATIONISM TRUE - AND HEAVON OR HELL HANG IN THE BALANCE - ONE MIGHT ASSUME PEOPLE WOULD BE VERY CAUTIOUS ABOUT THE RISKS THEY TAKE, BUT APPARENTLY NOT.

And, although it doesn't come from a creationist, this last little gem is so priceless that I thought it deserved a reply:

As I was browsing through sites directed towards homo erectus, I stumbled upon yours. I was looking for information regarding the lifestyles of early homo erectus. To my surprise, all I could find was a few general ideas backed up by two very stupid Far Side comics. Very informative (Sarcasm) !!!! Try putting more useful items in next time.
Thanks

DNGG (Mike Fetting)

Reply: *This has to be one of the most utterly cretinous statements I have ever seen.*

No matter how much information I tried to include, I would have to stop somewhere. My site is not intended to be a repository of the world's knowledge of paleoanthropology, even if I had the time and space to do so. My aim is to provide a brief summary of the subject, not to do the homework of every ***moron*** *who is too lazy to go to the library.*

If you think that the world desperately needs a web site about the lifestyles of early Homo erectus, I suggest you create one and see how many people visit it.

Mike apparently felt he hadn't made a big enough fool of himself and responded:

I really wanted to thank you for the response you gave to my feed back on your very uninformative Homo Erectus work (if that is what you will call it). The reason I thank you is because through your childish name calling and foolish use of your site, you have shown me that your work is in fact just what I thought it was: a waste of space. I also wanted to thank you for letting me know that I got under your skin and made you so angry. You really must be confident in your work to let an "idiot" college student make you so upset (sarcasm). Thanks again and remember, It is arrogant and supposedly scholarly people like you that give academics a poor reputation. Please post this in your site with a reply, because I really do want to hear how you justify acting like you are five and yet calling me an idiot. I feel the people should know as well. Thanks again.
Mike (DNGG)

Mike, let me spell it out for you since you don't seem to be able to work it out. If you look up the page, you will observe that you *started the insults, out of the blue and for no reason other than that my page didn't have the information you wanted. Why the hell should it? What do you think this is, the Mike Fetting Homework Help Site? Most five year olds have realized that if you dish out insults, you'll get some in return. Keep working on those social skills.*
(And, by the way, I'm not an academic)

Finally, the most unusual piece of feedback I have yet received:

Dear Dr. Foley,
I am the brain damaged child who could not spell and spent two years in grade 5 in 1960-61. As I sat and stared at the map of the world it occured to me that all the contenents where once one land mass since they seemed to fit so well together. This fact is now common knowledge.
To the point, there is no missing link. At least not on this planet.
Since it is very possible to walk out in your back yard and trip over dinasaur bones millions of years old, and we have as yet not found the link, I believe there is non to be found.
My theary is that we are aliens genetically altered to be less than our ansestors.
I have done extensive research on the U.F.O channels, There is a lot of red herring out there but I myself was abducted and my eggs removed. I am geneticly very sound.
If you would like to contact me and discuss more of my thearys please email
Diane N.

Paleoanthropology Links

Last updated: May 8, 1999

General

- Physical Anthropology, by Bonnie Sklar
- In Hand Museum - Leakey Ancestors
- The Genesis of Man
- Human Evolution Resources, by Mark Leney
- Human Evolution, by Handprint Media
- The Record of Human Evolution, by Eric Delson
- The Life and Times of Early Man, by Lin and Don Donn
- Human Evolution: you try it, from PBS NEW

Neandertals

- Neandertals: a cyber perspective, by Kharlena Ramanan
- Search for Neanderthals, with Earthwatch
- Neandertal Heaven, by Chris Hawkins
- The continuing story of Neanderthal Man, by Johan van der Dennen
- Neanderthal Museum (also in German)
- In Search of Neanderthals, by D. S. McDonald
- Amazing Neanderthals Science Kit NEW

Museums and Organizations

- American Museum of Natural History Anthro Bulletin
- Hunterian Museum - Hominid Evolution Guided Tour
- Institute of Human Origins (Don Johanson's organization)
- Missing Links Alive (Edinburgh Museums and Galleries)
- The Leakey Foundation NEW

Fossils and Sites

- Fossil Evidence for Human Evolution in China, by Dennis Etler
- Australian and Asian Palaeoanthropology, by Peter Brown
- The Atapuerca Home Page (in Spanish and English)
- Sterkfontein Cave (1)
- Prehistoric art from the Chauvet Cave (also in French)
- Tautavel Man (Arago) (also in French)
- Archaeological Excavations at Boxgrove, England. (A human tibia was found here in 1993)
- Human Paleontology Photo Gallery, from Cleveland State University

Books and articles

- How Humans Evolved, by Boyd and Silk

- A review of *The Neandertal Enigma*
- A review of *Origins Reconsidered*
- McGraw-Hill Anthropology Newsletters
- In Search of Human Origins, Part I (Part II, Part III), with Don Johanson

Courses

- Anthropology 365 - Human Evolution, by Randy Skelton
- Human Origins and Development of Culture, by Richard Effland
- Anthropology 102: Origins of Humans and Culture, University of Illinois
- Anthropology 301: Introduction to Physical Anthropology, by Claud Bramblett
- Anthropology 105: Human Origins and Prehistory, by Jeanne Sept

Merchandise

- Our Amazing Ancestors Science Kit (Recommended)
- Skullduggery full-size hominid skull models
- Ants Incorporated 1/2 size hominid skull models
- Cranium Magnum fossil skull reproductions
- Human Evolution: a multimedia guide to the fossil record
- Early Man Series of slides NEW
- Origins of Mankind, software from Maris, also published as Evolution of Man, software from Expert Software

Miscellaneous

- Piltdown Man Home Page, by Richard Harter
- A Mostly Complete Piltdown Man Bibliography, by Tom Turriton
- Computer-aided Reconstruction of Human Fossils (1, 2)
- The Lucy Test, by Matthew Priestley
- Aquatic Ape Theory: Sink or Swim?, by Jim Moore
- Teaching paleoanthropology to high school students, by Sandra Bornstein
- In Search of Human Origins, from National Geographic

On a lighter note:

- The Paleoanthropologist's Tale, by Ron Ecker (part of a book about evolution and creationism, done in the style of *The Canterbury Tales*)
- The Descent of Man, a humorous look at human evolution
- A Letter from the Smithsonian

See also the Crackpots page, for some unorthodox approaches to human evolution.

There are many Web pages on the Internet which look at human origins from a creationist point of view:

- Palaeoanthropology in Review, by Marvin Lubenow
- The Scientific Evidence for the Origin of Man, by David Menton
- Origin of Man, articles by David Menton
- Who's who & what's what in the world of "missing" links?, by Paul Taylor (also in French and in Spanish)

- Creation Science Home Page: The Big Issues
- Quotes about Fossil Man, by Don Patton
- In The Beginning: Ape-Men?, by Walter Brown (Response)
- Top evidences...(#4,#5,#6), by Doug LaPointe.
- The Missing Link Chronology, by Matthew Slick
- "Just So" Stories of Apes and Humans, by Ray Bohlin
- Missing Links, by Gregory Koukl
- Journey to Ethiopia, by Jeffrey Marr
- Early Man, by Douglas Sharp
- The "Ape-Men", by Garth Wiebe
- Ten Facts Concerning Human Evolution
- What Ailed Old Neanderthal Man?, by Erich von Fange
- The Fingerprints of God: The Origin of Man, by Robert Gange
- Lucy Fails Test As Missing Link, by Lane Anderson
- Evolved From a Lesser Animal?
- Fossil Man? Separating People from Apes, by Kofahl and Segraves
- Man From the Apes: Has Science Proved It Yet?, by Robert Kofahl
- Fossil Men and Alleged Human Ancestors, by Kofahl and Segraves
- Quotes on the Origin of Man, by Steve Birks
- The Search for Adam's Ancestors, by Elaine Kennedy
- Bones overthrown, an interview with Marvin Lubenow
- Creation Science FAQ: Human Evolution, by Darren Gordon (Response)
- Fossil Man, Part I (Part II, Part III), by Jon Covey
- Evolution: a Pernicious Lie, by Wallace Johnson
- The "Ape-Men" Fallacy, by Malcolm Bowden
- Human Evolution: the Molecular and Fossil Evidence, Part I (Part II), by Trevor Major
- Creation-Evolution Encyclopedia: Ancient Man
- Big Daddy?, by Jack Chick (Review)
- Human Evolution Poster, by Jack Chick
- Factsheet no. 17: Apes and Men
- The True History of Mankind, by J. H. John Peet
- Man's Missing Link: A Closer Look at the Evidence, by J. Tucker
- Monkey Business!, by Ronald Powell
- The Apemen Frauds, by Hank Hanegraaf
- The Hominid HomePage, by Jon Scott (Response)
- The Origin of Mankind, by Gary Parker
- Apes, Apemen and Men, by Lee Spencer
- The Myth of Human Evolution, by Harun Yahya
- Evolutionary Blunders, by Peter Maass 

This page is part of the Fossil Hominids FAQ at the talk.origins Archive.

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http://www.talkorigins.org/faqs/homs/links.html, 05/22/99

Paleoanthropology Fiction

This is a list of fictional works of paleoanthropological interest. I only included books if they featured extinct hominids (so, no novels about prehistoric modern humans). Be warned: given the lack of information about the lifestyles of non-*Homo sapiens* hominids, such works are at best speculative, and at worst highly implausible.

Email me if you know of any other works that should be included.

For a much wider range of paleontological and prehistoric fiction and non-fiction, visit the Paleobook site by Dan Gallagher, and the Prehistoric Fiction page by Steve Trussel. There's even a Cave Filmography page, listing films with prehistoric themes.

Fire Dancer (1996), by Victor Kelleher 

> Young adults fiction. A boy and a girl in their late teens are stranded in the past with a Neandertal clan after an accident during a sight-seeing trip into the past. An enjoyable story, with one of the more plausible and sympathetic depictions of Neandertals.

Operation Adam (1997), by Ivan Petrovitch C. (in French)

> Almost all of the original hominid fossils, gathered together for an international conference in Tucson, Arizona, are stolen by a secret creationist organization called the Protectors of Adam. The story follows the desperate attempts to retrieve the fossils, then the subsequent court case. (Follow this link for a more extensive discussion of this book)

The Evolution Man, or, How I ate my Father (1960), by Roy Lewis

> A very funny comedy about a family of ape-men headed by an ambitious father who is hell-bent on ascending the evolutionary ladder. (Originally published as *What we did to Father*).

The Inheritors (1955), by William Golding

> A story of contact between Neandertals and Cro-Magnons, by the Nobel prize-winning novelist. I have seen other people recommend it highly, but I found it uninteresting. YMMV.

Dance of the Tiger (1980), by Bjorn Kurten

> A novel of interaction between Neandertals and Cro-Magnons, as a young man searches for his father's killer. An exciting story, by an eminent European paleontologist who is an expert on Ice-Age faunas.
> Read Danny Yee's review of *Dance of the Tiger*

Singletusk (1986), by Bjorn Kurten,

> The sequel to *Dance of the Tiger*. Another enjoyable story.

A Different Flesh (1988), by Harry Turtledove

> A book of short stories, set in an alternative history in which *Homo erectus* survives in the Americas until modern times. Turtledove explores how we would react to the existence of an almost but not quite human species, and how it would affect our perception of ourselves. **Recommended**.

Orphan of Creation (1988), by Roger MacBride Allen

> A paleoanthropologist discovers skeletons of australopithecines buried in Mississippi around 1850, which raises the possibility that living australopithecines may still exist in Africa. Their discovery raises a disturbing question: what, exactly, is a human? (Allen also has some commentary on the creation/evolution debate.) **Recommended**.

The *Earth's Children* series, by Jean Auel
The Clan of the Cave Bear (1980)
The Valley of Horses (1982)
The Mammoth Hunters (1985)
The Plains of Passage (1990)

> In *Clan of the Cave Bear*, an orphaned human girl is found and raised by a group of Neandertals. The subsequent books continue her life after leaving the clan, and Neandertals play a much smaller role in them. Enjoyable and well researched, although some people find the detail and the length a bit much. Six books are planned for the series; #5 is close to completion but, according to rumor, may not hit the shelves until March '99.
> Read some reviews from the Pleiades Networks site.

Ancient of Days (1985), Michael Bishop

> A male *Homo habilis* is found wandering in Georgia, and embarks on a quest to become more "human".

The Ugly Little Boy (1992), by Isaac Asimov and Robert Silverberg

> A time-travel experiment brings a 3 year old Neandertal boy into the near future. This novel is based on a short story of the same name written by Isaac Asimov in 1958.

Almost Adam (1996), by Petru Popescu

> A paleoanthropologist discovers australopithecines living in a remote part of Kenya.

Neanderthal (1996), by John Darnton

> Paleoanthropologists discover Neandertals living in the remote mountains of Central Asia. Read reviews by Stevi Deter and Dick Draper, or visit the publisher's web page.

Paleoanthropologist Ian Tattersall reviewed the previous two books in Time, May 27, 1996. He didn't think much of either of them, and neither did I. For a book which does a much better job of investigating the issue of what it means to be human, Tattersall recommended the following:

You Shall Know Them (1953), by "Vercors" (Jean Bruller)

> A group of primitive hominids is found in New Guinea, and the question arises as to what rights, if any, they have. For example, is there any reason why they should not be used as slave labor, as an Australian businessman plans to do? When a hybrid human-tropi baby is born and the father kills it, the case goes to court, and the jurors must decide whether the baby was human or not.
> (This book was re-released in paperback in 1955, under the title *The Murder of the Missing Link*. It was originally published in French with the title *Les animaux dénaturés*. I am told it was also made into an obscure 1970 movie, *Skullduggery*, starring Burt Reynolds)

The Peking Man is Missing (1977), Claire Taschdjian

> A fictional account of the disappearance of the Peking Man fossils. The author worked as Franz Weidenreich's secretary, and was familiar with the fossils. Weidenreich and Teilhard de Chardin have thinly disguised counterparts with minor roles in this book, but the other characters are largely or entirely fictional.

Lost in Translation (1998), Nicole Mones

> Another book dealing with the Peking Man fossils, although they are much more peripheral than in the previous book. The central character is an American woman working as a translator in China who becomes involved with in a search for the missing fossils. Described by Amazon as "part mystery, part love story, and part cultural exchange".

Peking Man (1996), by Robert J. Sawyer

A short science fiction story about Peking Man and the disappearance of the fossils, available on the web. Sawyer has come up with an amusingly unorthodox solution to the Peking Man mystery! (Human evolution and Neandertals also play a small part in Sawyer's book Frameshift.)

The New People, by Jan-Ake Winqvist

On-line information on a graphic novel about Cro-Magnons and Neandertals (available in Swedish or Danish, also summaries in English, French and Spanish).

A Bone from a Dry Sea (1992), by Peter Dickinson

Children's fiction. Two parallel stories: the life of a group of australopithecines, and a young girl visits her scientist father at a paleontological site in Africa. A good read, but I would feel much happier recommending it if it wasn't based on the Aquatic Ape Theory, which has very little credibility among scientists. To see why, visit Jim Moore's site on the AAT. (Dickinson does not hide the fact that scientists don't think much of the AAT, but he implies that it is from closemindedness, rather than for any scientific reasons)

Seven Views of Olduvai Gorge (1994), by Mike Resnick

From the Oct/Nov 1994 issue of *Fantasy & Science Fiction*. Despite the name, only marginally related to human evolution, but an excellent story. It won both of science fiction's top awards, the Hugo and the Nebula, for best novella.

Journey from the Dawn (1990), by Donald Johanson and Kevin O'Farrell

An account of the life of a small *A. afarensis* band. Well illustrated, with many explanatory notes and photos of fossils and living apes to support their reconstruction (which many scientists disagree with) of australopithecine behaviour.

Fossil Hominids: Humor

Ancient Tech Support

The tech support problem dates back to long before the industrial revolution, when primitive tribesmen beat out a rhythm on drums to communicate:

This fire help. Me Groog

Me Lorto Help Fire not work

You have flint and stone?

Ugh

You hit them together?

Ugh

What happen?

Fire not work

(sigh) Make spark?

Ugh

You have tinder and kindling near spark?

Ohhhhhhhhhh.

The tech support problem dates back to long before the industrial revolution, when primitive tribesmen beat out a rhythm on drums to communicate:

This fire help. Me Groog

Me Lorto. Help. Fire not work.

You have flint and stone?

Ugh

You hit them together?

Ugh

What happen?

Fire not work

(sigh) Make spark?

No spark, no fire, me confused. Fire work yesterday.

sigh You change rock?

I change nothing

You sure?

Me make one change. Stone hot so me soak in stream so stone not burn Lorto hand. Small change, shouldn't keep Lorto from make fire.

Grabs club and goes to Lorto's cave

*WHAM*WHAM*WHAM*WHAM*

In article <Sc4b.3cf7@clarinet.com>, Dave Hemming wrote:

Recent evidence has come to light that suggests that pyramid style chain letters may have pre-dated Dave Rhodes by a considerable margin. Palaentologists recently deciphered the following, painted on a cave wall on the slopes of Kilimanjaro.

MAKE SPIKY CLUBS FAST!!!

Hello, not-tribe-member. Urk name Urk. Many moons ago, Urk in bad way. Urk kicked out of cave by Thag. Thag bigger than Urk, Thag take Urk spiky club, Urka (Urk wo-man). Urk not able kill deer, must eat leaves, berries. Urk flee from wolves.

Today, Urk big chief. Urk have best cave, many wives, many spiky clubs. Urk tell how.

WHAT DO: make one spiky club and take to cave places below. Add own cave place to bottom of list, take cave place off top. Put new message on walls many caves. Wait. Many clubs soon come! This not crime! Urk ask shaman, gods say okay.

HERE LIST:

```
   1) Urk
      First cave
      Olduvai Gorge

 few) Thag (not that Thag, other Thag)
      old dead tree
      by laked shaped like mammoth

 few) Og
      big rock with overhang
      near pig game trail

Many) Zog
      river caves
      where river meet big water
```

Urk hope not-tribe-member do what Urk say do. That only way it work.

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http://www.talkorigins.org/faqs/homs/humor.html, 04/24/98

Fossil Hominids: On the Fringe

Human evolution being a subject of wide general interest, crackpots seem to be drawn to it like flies to honey. Here are a few examples which can be found on the web.

Phrenology and Paleo-Anthropology and The Pre-Historic Type

> Phrenology is the pseudoscience, popular in the 19th century, which tried to determine personality traits from the shape of the skull. These pages apply phrenological principles to the study of *Homo erectus* skulls.

Dehydroepiandrosterone [DHEA], Melatonin, & Testosterone in Human Evolution

> Claims that DHEA is a crucial factor in human evolution, the evolution of eukaryotes, male homosexuality, migraine, La Tourette's Syndrome, SIDS, AIDS, sleep disorders, breast cancer, schizophrenia, and heaven knows what else.

Are scientists afraid of Ed Conrad?
Petrified hominid bones in Carboniferous strata

> A noted talk.origins net.kook, Ed Conrad has spent the last 15 years trying to persuade people that his collection of funny shaped rocks are actually human fossils. (Andrew MacRae and others have made detailed rebuttals of these claims.)

Origins of "Homo"

> This website argues that male homosexuality was responsible for the evolution of humanity.

Neanderthal = Nephilim? Carbon 14 Dating?
In Search of ... Neanderthal Man

> Could Neandertals be the Nephilim (Genesis 6:4) mentioned in the Bible? Find out here.

Homo Summetros

> Humanity is about to take its next evolutionary leap forward, and (surprise!) it just so happens that the author of this web page is one of the new people.

Everything you know is wrong: Book One: Human Origins

> This book by Lloyd Pye argues that all of the "hominid" fossils are upright-walking primates, better known under such names as the Yeti and Bigfoot.

Creationist Arguments: Misquotes

This file contains some of the more blatant instances in which creationists have misquoted their sources. In all cases where text had been made bold, the emphasis has been added by me.

Robert Kofahl's Handy Dandy Evolution Refuter and Wallace Johnson's book Evolution? both use the following quote (Johnson only has the second clause):

> "Not many (if any) [fossil hominids] have held the stage for long; by now laymen could be forgiven for regarding each new arrival as no less ephemeral than the weather forecast." (John Reader, Whatever happened to Zinjanthropus?, New Scientist, March 26 1981, p.805)

It sounds as if Reader is saying that most, if not all, fossil hominids have been discredited. But the previous sentence was:

> "*Australopithecus afarensis* is the latest fossil hominid to be thrust before the public as the **oldest evidence** of mankind's existence. Not many (if any) have held the stage for long; ..."

With the full context, it is clear that Reader was *not* saying that all fossil hominids have been debunked; he is referring only to their claimed status as the *oldest* evidence of human evolution. In fact, Reader's article explicitly says that *H. erectus* is still considered to be a human ancestor.

Paul Taylor, in The Illustrated Origins Answer Book (Ed.4, 1992) says:

> "Current evidence seems to indicate *Australopithecus* was an extinct ape and nothing more [205].
>
> 205: William L. Jungers, "Lucy's limbs: skeletal allometry and locomotion in *Australopithecus afarensis*," Nature, Vol. 24 pp 676-678 (analysis of "Lucy's" anatomical structure shows she may not normally have walked upright)."

Jungers does not say or even imply that Lucy did not walk upright. Quite the opposite, in fact. His paper says:

> "Diagnostic details of the knee joint and bony pelvis of *A. afarensis* are **compelling** indicators of a bipedal adaptation."

Walter Brown, in his book In the Beginning, says:

> "Eugene Dubois conceded forty years after he discovered Java "man" that it was just a large gibbon."

In support of this statement, Brown gives the following quote:

> "Pithecanthropus [Java man] was not a man, but a gigantic genus allied to the Gibbons ..." Eugene Dubois, "On the Fossil Human Skulls Recently Discovered in Java and Pithecanthropus Erectus," Man, Vol. 37, January 1937, p. 4.

However Dubois' complete sentence was as follows:

> "Pithecanthropus was not a man, but a gigantic genus allied to the Gibbons, however superior to the gibbons on account of its exceedingly large brain volume and distinguished at the same time by its faculty of assuming an erect attitude and gait."

These do not sound like the words of a man who is dismissing Java Man as a mere ape that had nothing to do with human evolution. Indeed, Dubois, an exceptionally stubborn man, never ceased to believe that Java Man was a primitive human ancestor.

Brown also cites Stephen J. Gould's essay Men of the Thirty-third Division in support of his claim, even though the the whole point of Gould's essay was to refute the myth (common among evolutionists as well as creationists) that Dubois had ever called Java Man a gibbon. (This essay can be found in Gould's book Eight Little Piggies, or in the April 1990 issue of the magazine Natural History).

Doug LaPointe, in Top Evidences Against the Theory of Evolution, #6 says of *Homo erectus*:

> "In fact, its brain is said to extend "... into the middle range of Homo sapiens." (F. Clark Howell, "Early Man", p.42)"

What Howell really said was:

> "The first man of own genus, *Homo erectus* is modern of limb but more primitive of hand and brain, with a cranial capacity extending only into the **lower ranges** of *Homo sapiens*."

David Menton, in The Scientific Evidence For the Origin of Man, writes about the fossil WT 15000 (the Turkana Boy) and says:

> "He had a low forehead and pronounced brow ridges not unlike some races of modern man. Richard Leaky [sic] said that this boy would go unnoticed in a crowd today."

Don Patton uses a similar quote, saying that according to Richard Leakey:

> "....he would probably go unnoticed in a crowd today."

What Leakey really said, in the November 1985 issue of National Geographic, was:

> "Suitably clothed and **with a cap to obscure his low forehead and beetle brow**, he would **probably** go unnoticed in a crowd today."

Patton also says:

> 'THE OLDEST MAN', "[African Footprints] ....they belonged to the genus Homo (or true man), rather than to manapes (like Australopithecus, who was once a thought to be the forerunner of man but is now regarded as a possible evolutionary dead end). ....they were 3.35 million to 3.75 million years old. ....they would, in Mary Leakeys words, be people 'not unlike ourselves,'...." Time, Nov. 10, 1975, p.93

The article in Time refers to a number of fossils found at Laetoli and at first thought to belong to the genus *Homo*. The Laetoli footprints are not mentioned, since they were not found until the following year.

The complete sentence from Time says:

> "If all these creatures are in fact close kin, they would, in Mary Leakey's words, be people "not much unlike ourselves," though not much more than 5 ft. tall and with much shorter life spans and somewhat smaller brains".

Clearly, "not much unlike ourselves" is a relative term, and no one was claiming these fossils were of *modern* humans. They were not, and are now considered to belong to *Australopithecus*.

Another Patton quote:

> "[Adrienne] Zihlman compares the pygmy chimpanzee to "Lucy," one of the oldest hominid fossils known and finds the similarities striking. They are almost identical in body size, in stature; and in brain size.... " (Science News, Vol.123, Feb.5. 1983, p.89)

Once again, Patton has omitted contextual information that would weaken his case. The full sentence reads:

> "They are almost identical in body size, in stature, and in brain size, she notes, and the major differences (the hip and the foot) represent the younger Lucy's adaptation to bipedal walking."

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http://www.talkorigins.org/faqs/homs/misquotes.html, 04/28/97

Fossil Hominids: About these pages

Why have you written these pages?

In mid-1994, I realized that despite fairly wide popular interest in human origins, the talk.origins archive contained almost no information on the topic. The archive also lacked responses to creationist arguments about human evolution, a serious omission considering the importance of human evolution in the creationism/evolution debate. Although there are quite a few books on human evolution written for the general public, these generally mention only a few of the major fossils, scattered throughout the book and often incompletely described. I felt there was a need for a concise list of the most important hominid fossils.

Compiling such a list was harder than it sounds. Although there were many popular books on human evolution, none of them contained details of most of the important fossils, so it was necessary to use many sources. (The new book From Lucy to language (Johanson and Edgar, 1996) largely solves this problem, and also contains a gallery of superb photos of many important fossils.)

The first version of these pages was placed in the talk.origins archive in November 1994, and has grown steadily in size and completeness since then. It is, I believe, the most comprehensive treatment of creationism and human evolution to be found on or off the web, and I am committed to keeping it that way.

Why bother refuting creationist arguments about human evolution?

Because creationism is dreadful science. In fact it's not science so much as a campaign to evangelize fundamentalist religion. Creationists are running scared from the evidence for human evolution, as well they should be. They have no good explanation for the fossils, and human evolution is a topic on which the creationists are especially vulnerable because they can't afford any compromise. If humans evolved, then the whole rationale for creationism collapses.

Anything else?

Well, since you ask, let me show you where I went on my summer vacation. No really, it's relevant to this site.

Here are some other **Frequently Asked Questions** I receive:

What are your qualifications?

A number of people have wanted to know what my qualifications are for writing on human evolution and maintaining these web pages. In a word: none. (I do have qualifications, but they are totally unrelated to paleoanthropology.) These pages, and the effort that went into writing them, will have to serve as their own qualifications. I have read a lot of both scientific and popular literature to make them as accurate as possible. Many people, including university professors and even some paleoanthropologists, have made positive comments about them, so I am confident that my summary of human evolution is generally accurate. If you find any errors (sigh), let me know.

Do you know Richard Leakey's email address?

Well, I have an email address that I have been told is his, but I've never used it. I won't give it out because he is a busy man and probably doesn't want to hear from everyone who would like to drop him an email. If you have a good reason to get in contact with him, take the time to write by normal mail (P.O. Box 24926, Nairobi, Kenya, according to one website).

Is there a copy of that "March of Progress" image on the web?

This famous graphic shows a sequence of primates walking from left to right, starting with small knuckle-walking apes, graduating through a series of ape-men, and finishing with a modern Cro-Magnon male. It was drawn by Rudy Zallinger and first published in Early Man, a 1970 Time-Life book written by paleoanthropologist F. Clark Howell. It has become a cultural icon, endlessly copied and parodied. However, the original drawing is not on the

web as far as I know, although some derivations of it are (for example, here, or here, or here).

The drawing often creates a misleading impression of human evolution as a steady progression from apes to humans. It has always been known that not all the species in that series were human ancestors (for example, the robust australopithecines).

This page is part of the Fossil Hominids FAQ at the talk.origins Archive.

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http://www.talkorigins.org/faqs/homs/about.html, 02/25/98