

## 'PITHECANTHROPUS IV': A HUMAN EVOLUTIONARY ANCESTOR OR AN ARTIFICIAL RECONSTRUCTION?

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### Abstract

*In 1939 the remains of an early "hominid" were discovered in Java. These remains have been interpreted as representing an intermediate form between Australopithecus and Homo erectus. However, statistical and morphological data show these remains to be an artificial combination of disparate (dissimilar) skeletal elements.*

### Introduction

In 1939 the cranial remains of an "early hominid" were discovered in the Sangiran district of central Java. Called "*Pithecanthropus IV*" (also Sangiran 4 or "*Pithecanthropus modjokertensis*"), the remains were first reported by von Koenigswald and Weidenreich (1939) and later exhaustively described by Franz Weidenreich (1945).

The specimen consists of the posterior two-thirds of the cranial vault and the lower portion of both maxillae and associated dentition, including ten teeth (Jacob, 1975; Day, 1986). Several paleoanthropologists have argued that this specimen may represent an earlier ancestral form to *Homo erectus*, or at least a taxon that gave rise to the evolutionary grade of *H. erectus* (von Koenigswald, 1973; 1975a; Jacob, 1975; 1979). However, other paleoanthropologists have called attention to the extreme anatomical peculiarities of this specimen (Krantz, 1975; Phillipps, 1991). The purpose of this study is to establish whether or not these remains may have been incorrectly reconstructed.

### Anatomical Description

The cranial remains are represented by a nearly complete occipital bone, including the occipital condyles and foramen magnum, temporal bones, and the posterior part of both parietal bones. The specimen has a massive occipital torus that projects backward beyond the level of the supraoccipital squama. Marked impressions on the nuchal area of the occipital bone indicate powerful neck muscularity. The remains display a marked frontal keel with parasagittal depressions (Day, 1986, p. 348).

In addition, the maxillae are represented by complete alveolar processes, except for the posterior part of the left side. Almost the entire palate is intact, and the floor of the nasal cavity, as well as the maxillary sinuses of both sides, are also preserved. However, the maxillae were crushed, probably before fossilization, causing distortion of this area of the face.

All of the dentition is intact, except for the incisors and the left second and third molars. The palate displays some peculiar "primitive" characteristics. For example, the canines are unusually large by comparison with most "hominids" within *H. erectus* (which most evolutionists believe "*Pithecanthropus IV*" has direct affinities to) and their breadths exceed their lengths (Weidenreich, 1945; Day, 1986). Of particular importance is the fact that the specimen's canines project below the level of the adjacent teeth and there is a diastema

(gap) between them and the lateral incisors (Wolpoff, 1980). These are pongid traits not normally found in the combination described above (see Figure 1).

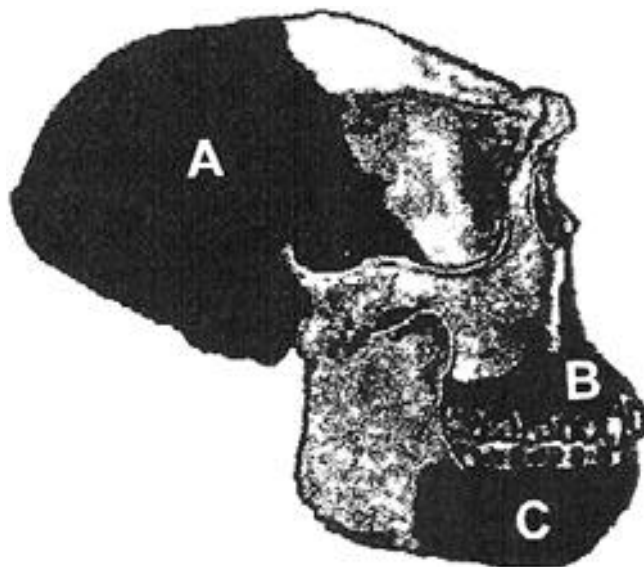


Figure 1. Lateral view of "*Pithecanthropus IV*" Part A appears to be of the genus *Homo*. Part B appears to be from the genus *Pongo* (Orangutan). Part C comes from a third individual referred to as "*Pithecanthropus Mandible B*."

### Suggested Affinities

The "*Pithecanthropus IV*" specimen is highly problematic to any evolutionary scenario. It shows a number of *H. erectus* features, including thickened bones of the cranial vault, backward projecting attachment area for the neck muscles, and a spongy bone development at the cranial base. However, the palate and its dentition are unlike *H. erectus*, instead resembling the genus *Pongo* (Krantz, 1975, p. 361). It is highly suspect how a specimen considered to be either a Javan geographical variety of *H. erectus*, or a taxon that was a precursor, could somehow have characteristics allegedly lost long ago by its evolutionary ancestors.

As a result of this unusual mixture of cranial characteristics a number of evolutionary interpretations have been given, none of which fits the available data. Hulse (1971, p. 214) complains that:

The cranial capacity [in "*Pithecanthropus IV*"] is much greater than among apes and approaches that of *Homo sapiens*. But the canine teeth are more ape-like, and no one has advanced a satisfactory hypothesis to explain this fact.

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Despite such difficulties several possible explanations have been suggested. The first of these is that "*Pithecanthropus IV*" shows a reappearance of characteristics from a distant ancestor of great antiquity (Krantz, 1975). However, such an explanation is not based on any empirical data but is rather a reflection of the plasticity in the Neo-Darwinian theory of evolution (Macbeth, 1971; Johnson, 1991).

A second possibility is that *Homo* may not be a descendant of the australopithecines at all (Zuckerman, 1970; Oxnard, 1975, 1984). The inference from an evolutionary interpretation is that:

"... Australopithecines developed hominid dentition at an early date without significant increase in brain size, while the reverse was happening in the line leading to *Homo*" (Krantz 1975, p. 362).

While most creationists would agree that the australopithecines are not related to the origin of *Homo sapiens* (Gish, 1985), evolutionists are caught on the horns of a dilemma: There are either no evolutionary ancestors from the Villafranchian (the earliest part of the Pleistocene) if the australopithecines are rejected, or ancient pongids in some cases had more human-like dentition than "early *Homo*."

An additional possibility is here maintained: "that the brain case and palate [of "*Pithecanthropus IV*"] are from two different individuals" (Krantz 1975, p. 363).

#### A Questionable Reconstruction

In 1939, when G. H. R. von Koenigswald discovered the "*Pithecanthropus IV*" remains, it was assumed that all the fossil material involved belonged to one individual. At the time that was a reasonable assumption, since the remains were found in close proximity (although exact distances between the skeletal parts when they were excavated is unclear) in the same stratigraphic deposit, and the individual cranial parts showed the same general state of preservation. However, the individual skull parts do not contact or articulate in any manner. Instead, large areas of the front part of the skull are merely filled in, based on pure conjecture. In some cases reasonable reconstruction can be accomplished where one side or the other part of a skull or limb is missing, since many skeletal parts are anatomically mirror images of each other. However, in this instance far too much skull material is missing to accurately extrapolate what is in between.

The reconstructed skull of "*Pithecanthropus IV*" has been illustrated in numerous catalogs and atlases of fossil man, for example Brace, Nelson, and Korn (1971, p. 51) or Larsen and Matter (1985, p. 117). In every case known to the author, the reconstructed cast is not only shown to introductory students with the missing parts filled in but an additional set of remains, the "*Pithecanthropus* mandible B," has been used to reconstruct the mandible of "*Pithecanthropus IV*." If one were to look at the cast without checking one of the fossil man catalogs it would be impossible to tell that the reconstruction is based on at least two and probably three different individuals, at least one of which is likely pongid (see Figure 1). Although most casts establish which parts are based on recovered fossil bone (usually determined by color differences) versus the parts that were not recovered, one would not know

from a cast alone whether or not all the remains were from one individual.

#### Evidence for More than One Individual

Krantz (1975, p. 363) has maintained that the palate cannot have come from the same individual as the "*Pithecanthropus IV*" skull because the reconstructed breadth is implausibly excessive. The external breadth as found is about 84 mm. The left side was partially crushed in, therefore the reconstructed palate breadth is 94 mm (Weidenreich 1945, p. 32).

In all "hominid" and anthropoid skulls the glenoid fossae are extensively farther apart than are the external alveolar borders. However, the "*Pithecanthropus IV*" specimen has a reconstructed palate that shows the exact opposite.

To obtain statistical meaning for this, Krantz (1975, p. 364) measured external palatine breadths and the distances between centers of glenoid fossae in a sample of 17 *Homo sapiens* skulls. The results were:

Palatine breadths were expressed as a percentage of the interfossa [glenoid fossa] breadths. These ranged from 58.9 percent to 74.2 percent, with a mean of 65.7 percent, and with a standard deviation of 4.16. For Java skull IV ["*Pithecanthropus IV*"] it is 103.3 percent, which is over nine standard deviations away from the *H. sapiens* mean.

In addition Krantz (1975) took the same measurements on casts of five other ancient "hominids" and a selection of several different extant pongids, including chimpanzee, gorilla and orangutan specimens. The results were the same. Palatine breadth measurements were found to be within the range found in the *H. sapiens* sample.

However, von Koenigswald (1975b, p. 378) has maintained that the width between the third molars of "*Pithecanthropus IV*" is 68 mm not the 84 to 86 mm reported by Krantz (1975). In response Krantz (1975, pp. 377-378) has pointed out that his measurements of the breadth of the "*Pithecanthropus IV*" palate are the same as those determined by Weidenreich (1945). Further, Krantz (1975, pp. 377-378) has maintained that the differences between his measurement of palate breadth and that of von Koenigswald's stem from the fact that the fossil palate is broken through the socket of the first left incisor. The left maxillary area is shifted toward the midline and fossilized in that position. Both Weidenreich (1945) and Krantz (1975) moved the left maxilla back to its natural position and then measured what was the original palate. Krantz (1975) has maintained that von Koenigswald's measurements were apparently taken from the specimen in its distorted condition—a condition that is here argued to be of only minimal significance.

#### The Significance of "*Pithecanthropus IV*"

Although the "*Pithecanthropus IV*" specimen is not as well known to the public as are some "hominids," it has been considered an important intermediate form in documenting the alleged evolution from "earlier" Asian taxa to the main morphotype of *Homo erectus*. Le Gros Clark (1978, p. 120), after listing what he has maintained are diagnostic characteristics of *Homo erectus* states,

A definition of the kind given above hides a further problem. It gives the impression that populations of *Homo erectus* are all more or less centered on an average "type" which we have defined. This, however, is obviously not the case. Not only are there considerable differences between the various and far-flung geographic races, but the long period of time, perhaps 1,000,000 years, through which *Homo erectus* evolved witnessed considerable changes in its morphology. Deep in the Djetis levels of Java lay that very primitive, heavily built skull (S4) [*"Pithecanthropus IV"*] with its 750 cc cranial capacity, while up in the Mindel deposits of Eastern Europe, dated not much more than 400,000 BP that extraordinarily modern looking Verteszollos occipital bone was discovered with its modern-sized brain. This may make trouble for the taxonomist, but it is precisely the kind of situation that paleoanthropologists are looking for: the fossil evidence of an evolving, changing lineage; one that moves from a more primitive to a more advanced state over a known period of time. The data may not respond to neat classification and categorization, but in this instance they demonstrate quite conclusively the general course and nature of hominid evolution.

In addition, the "*Pithecanthropus IV*" specimen has been dated as one of the oldest of the *H. erectus* specimens at  $1.9 \pm 0.5$  million years B.P. (Jacob, 1981; Cybulski, 1981). Further, the "*Pithecanthropus IV*" remains and two other specimens associated with the "*Pithecanthropus modjokertensis*" taxon (the skullcap of an infant from Peking [Mojokerto], and the fragmentary mandibular remains of an adult, Sangiran 1b) have been proposed to have been at the very base of the origin of *Homo erectus* as part of a morphotype that may have extended back as far as 2.4 to 2.5 million years B.P. (Cybulski 1981). However, claims of great antiquity for the Asian *H. erectus* specimens listed above were based solely on the widely quoted K-Ar date of  $1.9 \pm 0.5$  million years B.P. for the Puchangan beds at Mojokerto discerned by Jacob and Curtis (1971, p. 50). By the middle of the 1980's several evolutionists became highly critical of such an old age for *H. erectus* remains in Asia, since most evolutionary scenarios for the origin of *H. erectus* suggest an African origin. For example Bilsborough and Wood (1986, p. 305) pointed out that the K-Ar date has a large associated error, and that one isolated estimate is of little value. Others noted the confusion over the proximity of the dated sample to the Mojokerto calvaria (also called Peking 1) (Swisher et al., 1994). Therefore some workers revised the age of "*Pithecanthropus IV*" down to about 1.3 million years B.P. (see Table I) (Pope and Cronin, 1984; Pope, 1988; Rightmire, 1990). However, most recently Swisher et al. (1994) have obtained radiometric dates that strengthen the earlier 1.9 million years B.P. age for the "*Pithecanthropus IV*" / Mojokerto morphotype. The Swisher et al. (1994) study obtained data from  $^{40}\text{Ar}/^{39}\text{Ar}$  laser-incremental heating of hornblende separated from pumice recovered at the Mojokerto "hominid" site in Java. The samples yielded "well-defined plateaus" with a weighted mean age of  $1.81 \pm 0.04$  million years B.P. Since the oldest dated African *H. erectus* specimens known at the present time, those

**Table I. The oldest known pertinent *H. erectus* sites and their comparison in age B.P. to the "*Pithecanthropus IV*" and Mojokerto specimens. The assigned ages are based on an evolutionary interpretation of radiometric and biostratigraphic data. The ages for each specimen are rounded to the nearest 100,000 years before present. After Cybulski, (1981); Gibbons, (1994); Swisher et al., 1994.**

Years B.P.	Africa	Asia	Europe
500,000		Zhoukoudian	
600,000			Maur
700,000		Lantian?	
800,000	Ternifine?		
900,000		Trinil?	
1,000,000			
1,100,000			
1,200,000			
1,300,000		* <i>Pithecanthropus IV</i> younger date	
1,400,000	Olduvai Gorge		
1,500,000	Konso Gardula Swartkrans? Nariolotime	Dmanisi?	
1,600,000		Sangiran	
1,700,000			
1,800,000	Koobi Fora	Mojokerto	
1,900,000		* <i>Pithecanthropus IV</i> older date	
2,000,000			

from Koobi Fora in Kenya, are interpreted to be about 1.8 million years old, the oldest *H. erectus* remains in Asia are of comparable age. Therefore, evolutionists can no longer dogmatically maintain an African origin for *H. erectus*. The "early" date of "*Pithecanthropus IV*," coupled with its unusual morphology, make it an important specimen in evolutionary scenarios of "hominid" evolution.

In sum, although the dates assigned to Pleistocene "hominids" such as "*Pithecanthropus IV*" are highly questionable (Lubenow, 1993), if the specimen actually consists of the remains of one ancient individual that would strongly support an evolutionary change from an earlier taxon into the general *H. erectus* morphotype (unless the specimen represents a curious mosaic, like *Archaeopteryx*). The reason is that this specimen contains a suite of unique characteristics (described above) not found in other individual *H. erectus* specimens.

On the other hand, if the "*Pithecanthropus IV*" specimen is not valid then the characteristics which make up the *H. erectus* morphology may be more easily interpreted within a creationist framework. For example, several evolutionists, including Jelenek (1978; 1980), Wolpoff, Wu, and Thorne (1984), and Stringer (1993), as well as creationists (Lubenow, 1992) have suggested the "sinking" of some specimens, or the entire taxon *H. erectus* into *H. sapiens*. The general morphology of *Homo erectus* is so much like *Homo sapiens* as to be indistinguishable in many characteristics.

For example the use of high resolution computer tomography, known as CT or Cat which yields three-dimensional images of small structures, has been used to scan the inner ear chambers of hominid fossils (including three *H. erectus* and four Australopithecine

specimens), extant primates, and *Homo sapiens* specimens (Spoor, Wood, and Zonneveld, 1994).

Measurements were taken of the height and width of the arc of each semicircular canal from the inner ear area (from the sample noted above) during CT scans. Based on these measurements, the radius of curvature was calculated. The extant specimens in the sample were then used to correlate arc size of the semicircular ear canals with body mass. Spoor et al. (1994) argued that *H. sapiens* has a larger anterior and posterior canal and a smaller lateral canal than great apes when body mass is taken into account. Based on these data, Spoor et al. maintained that *H. erectus* had the same inner ear morphology as *H. sapiens* and was therefore an "obligatory biped."

Even more interesting were the results interpreted for the Australopithecine specimens. The Australopithecine inner ear dimensions resembled those of modern great apes such as chimpanzees and gorillas. That suggests a much more arboreal lifestyle for the Australopithecines than most evolutionists would like to admit. The reason for this is that bipedal locomotive behavior puts particular demands on the vestibular apparatus of the inner ear, since upright body posture requires balancing on a very small area of support.

*H. erectus* is so much like modern *Homo sapiens* that Richard Leakey (1992, p. 55) has stated,

When I hold a *Homo erectus* cranium in my hand and look at it full face, I get a strong feeling of being in the presence of something distinctly human. It is the first point in human history at which a real humanness impresses itself so forcefully.

### Conclusion

The reconstructed cast of "*Pithecanthropus IV*" is unquestionably the remains of at least two individuals and probably a compilation of three, at least one of which is a pongid. The implications of that evidence are significant. Few "hominid" remains have ever been proposed as transitional forms between the Australopithecines and *Homo erectus*. If macroevolution is true, such intermediates must have existed. However "*Pithecanthropus IV*" can no longer be put at the bottom of an evolutionary branch in a phylogenetic tree. Instead, it is at best a faulty reconstruction.

Still, many paleoanthropologists have maintained that *Homo habilis* is an intermediate taxon between *Australopithecus* and *H. erectus*. In fact "*Pithecanthropus IV*" has been considered by some evolutionists to be the Asian equivalent of the African *Homo habilis* (Tobias and von Koenigswald, 1964; Le Gros Clark, 1978; Cronin, et al. 1981, p. 113). For example Cronin et al. (1981, p. 113) note,

The African sample has generally been referred to as *Homo habilis* L. Leakey, Tobias and Napier 1964, or simply *Homo* sp., while the earliest Javan hominids have been referred to as *Homo modjokertensis* von Koenigswald 1936 [including "*Pithecanthropus IV*"]. These two may be morphologically and temporally coterminous.

However, the postcranial anatomy of *H. habilis*, as recently established by the OH (Olduvai Hominid) 62 remains, have been described as "strikingly similar to that of some early *Australopithecus* individuals"

(Johanson et al. 1987, p. 205). In addition the OH 62 humerofemoral index which is a measurement of the humerus length as a percentage of the femur length) is an estimated 95% (Johanson et al., 1987; Leakey and Lewin, 1992). Such a ratio is highly significant when compared to modern humans (about 70%), *Australopithecus afarensis* ("Lucy"; 85%), and modern chimpanzees (100%). This figure places OH 62 closer to chimpanzees than to *A. afarensis* ("Lucy") in limb ratios, causing Alan Walker to state,

If they have an evolutionary scheme that goes from *afarensis* to *habilis* to *erectus*, then the limb proportions go from less apelike at something under three million years in *afarensis* to more apelike at 1.8 million years in OH 62, and then back to less apelike at 1.6 million in *erectus*" (Leakey and Lewin, 1992, p. 118).

Other workers have argued against the bipedality of *H. habilis* based on OH 8 (Oxnard and Lisowski, 1980). Still others have rejected *H. habilis* as a taxon altogether (Brace et al., 1973).

Therefore, although some fossil specimens have been proposed as intermediate forms between the Australopithecines and *H. erectus* (particularly specimens like "*Pithecanthropus IV*" and the *H. habilis* taxon), thus establishing human evolution as a fact, the evidence does not support such conclusions. Rather, it is here maintained that "*Pithecanthropus IV*" is at best a faulty reconstruction, and that those specimens called "*H. habilis*" may be an artificial amalgam of unrelated individuals compiled from other taxa.

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## PANORAMA NOTE

### Reprinted CRSQ Volume 22

#### Introduction

The *Creation Research Society Quarterly* has been published since 1964 (31 complete volumes). In an effort to make these volumes available, all of the missing issues have been reprinted. Brief synopses have been written on volumes 1-21 and have appeared in the previous 21 Quarterlies. In each synopsis, major articles are reviewed to give a person interested in scientific creationism a general idea of the contents of that volume. Many of the articles are of continuing interest and value.

#### Astronomy

An annular solar eclipse occurred on May 30, 1984. Englin and Howe (1985, pp. 7-9) reported on the event and discussed it from a creationist perspective. Armstrong (1985a, b, p. 123) presented short notes on the Sun's energy source and on Olbers' paradox. The limitations of the scientific method and creationist interpretations were included. A review of an article by Isaac Asimov on the unlikely circumstance of finding life outside our solar system was written by Wolfrom (1986, pp. 180-181).

#### Anthropology, Archaeology, Population Studies

A difficulty in classical hominoid theory from the science of molecular anthropology was noted by Jerry Bergman (1985, pp. 142-143). The famous fossil, known as Lucy (*Australopithecus afarensis*), was claimed to be that of an "apeman." Mehlert (1985, pp. 144-145) indicated evidence to the contrary and stated . . .

that Lucy was no more than a variety of pigmy chimpanzee . . ." (p. 145).

In a two-part presentation, Vaninger (1985a, pp. 33-39; 1985b, pp. 64-67) examined the so-called conflict of the antiquity of ancient civilization and biblical chronology. The author abstracted his work as follows:

Near the end of the 19th century, A. D. White made the claim that historical and scientific evidence regarding the antiquity of ancient civilizations proved that the Biblical chronology was impossibly short and of no historical value. During the course of the 20th century, historians have been steadily decreasing their estimate of when ancient civilization began. In recent years, several scholars have been working on a radical revision of ancient history which reduces the antiquity of ancient civilization even further. These recent revisions of ancient history may very well prove to eliminate entirely any supposed conflict between Biblical chronology and the antiquity of human civilization (p. 33).

Some of the topics covered in this interesting series are:

- Biblical chronology
- Egypt
- Oedipus and Akhnaton
- Ages in chaos
- Babylonian/Hittite empire
- Sea peoples/Persians
- The Exodus problem
- Overlapping dynasties
- The conquest of Canaan