# THE IMMEDIATE ANCESTOR OF THE MODERN MAN

## Thesis Statement

Human beings have evolved significantly, keeping in mind our adjoining existing relatives; the African Apes[[1]](#footnote-0). Darwin’s theory of evolution posits that the species were forced to adapt to the strides and robust requirements of their species as time progressed. As such modern human beings have developed rapidly, which explains why they are so different from the African Apes. Through the journey of evolution, the genus *homo* has experienced significant changes. Such changes are manifested in features such as; brain size, growth rates and development, lifespans, physique, foraging techniques and dietetics[[2]](#footnote-1) among others. However emerging archaeological evidence has played a substantial role in complicating the elucidations of the progression of the genus *homo*,[[3]](#footnote-2) particularly the *Homo erectus.* As such, this paper reviews existing literature in an attempt to bring foresight into the *Homo erectus.* The paper will pay specific attention to aspects such as the discovery of the fossil, its dating and morphology, culture and the subsequent extinction of the species.

## The Discovery of the *Homo Erectus*

The period between the late 19th century and early 20th century (specifically 1890s through to 1930s) saw a lot of archaeological discoveries into human fossil remains[[4]](#footnote-3). Most of these discoveries were made in Java and China[[5]](#footnote-4). It is imperative, at this point, to note that once a discovery of a potential human remain is made, a lot of scientists often put forward different theories to explain the stratigraphic and paleo-ecological sequence of the fossil. As such, most scientists often defer on these issues together with the potential culture of the fossil. The discovery of the *Homo erectus* was not immune to these controversies. The major problem with the classification of fossils into the taxon was the fact that most fossil remains were discovered in areas that are worlds apart geographically. Fossil remains of the species have been escavated in Africa, Asia, and Europe; although most sites containing remains of the *Homo erectus* have been revealed in Indonesia and China[[6]](#footnote-5).

In Asia, the earliest sightings of the specieswere made in 1891 in Java[[7]](#footnote-6) where archaeologists discovered a skullcap, a year after the discovery of the mandibular remains at Kedung Brubus in 1890. It took two decades for a quality discovery to be made, where the archaeologist discovered that the existence of sound conserved remains of skulls and teeth at a site in Zhoukoudian[[8]](#footnote-7). Although most of these remains of the hominin were destroyed during the Second World War, some photographs and descriptions still exist to give account of this taxon[[9]](#footnote-8). Since then, no significant discoveries were made at the site. Other sites that yielded results in Asia include China; Gongwangling where a skull was discovered, Chenjiawo where a lower jaw was discovered, Lotanndong Cave among others and Indonesia; the most significant location is in Sangiran where remains such as mandibles and cranium were discovered[[10]](#footnote-9).

In Africa, the most significant the discovery that proved that the species had inhabited both Africa and Asia was made at Tingenif in Algeria[[11]](#footnote-10) where mandibles and cranial bones were discovered. In 1960, Louis Leakey discovered a braincase at Olduvai Gorge. The anatomy of the skull was similar to some of the specimen discovered at Sangiran and Zhoukoudian. As such, most scientists agreed that the specimens in Africa and Asia belonged to the same species[[12]](#footnote-11). Further discoveries in Africa were made at Koobi Fora in the Turkana basin where the fossil remains were complete compared to the ones discovered in Asia and Olduvai Gorge[[13]](#footnote-12). However, they were more or less similar to the ones discovered in Asia indicating that they belonged to the same species.

A discovery in 1968 by a Dutch missionary, Theodor Verhoeven, of stone tools at Flores, which is an Island in Indonesia would further complicate the classification of the *Homo erectus[[14]](#footnote-13).* The complication arose in the fact the species would have had to cross the fast waters of Wallace's line to make it to the island. Decades later, fossil remains were found on the island, yet this did not lessen the complications, but simply exacerbated the matter. There is still an ongoing debate by scientists whether the remains are of another species or whether the remains belong to the *Homo erectus* taxon.

## Dating of the fossil remains

After the discovery of fossil remains, scientists often try to put it into an evolutionary sequence imposed upon the fossil by evolution. As such, scientists try to prove that human evolution is indeed a normative fact. To place a fossil into its evolutionary sequence, the morphology and appropriate date to is required[[15]](#footnote-14). Morphology, which is ideally the shape and structure of the fossil, cannot be changed. This means that the dating of the fossil is the more subjective matter at hand[[16]](#footnote-15). In a single excavation site, researchers often find remains scattered[[17]](#footnote-16), therefore they have to first assemble them before they can begin dating them. To determine the age of the fossil remains discovered, scientists are forced to use dating methods. In dating, principles of stratigraphy are applied so that scientists use events recorded in rocks, as a consequence of radioactive decay to come up with the approximate age of the species[[18]](#footnote-17).

The attempts to date the remains of *Homo erectus* have faced many different challenges. The limitation of dating methods has been a major contributor of the setbacks incurred in dating the fossil remains[[19]](#footnote-18). As aforementioned, the remains of the *Homo erectus* were discovered in different geographic areas. While the morphology of these specimens was arguably similar, the dates posited varied from one locality to another, with the fossils from Turkana basin being considered the oldest remains[[20]](#footnote-19). As a matter of fact, most of the remains discovered from East Africa are more ancient than the ones discovered in North Africa and Asia. On average, the hominin is considered to have existed for more than 1.6 million years ago[[21]](#footnote-20).

## Overview of the Morphology of the Homo Erectus

By definition, as mentioned herein, morphology refers to the shape and structure of the fossil remains. The essence of reviewing the morphology of the definition is for scientists and the people, in general, to be able to identify the species. Furthermore, morphological classification helps to place the species into its evolutionary sequence. Thus, this assists in granting the hominin its place in the evolution of mankind. This overview will give specific attention to the more pronounced features of the species, which are significant in separating the species from the modern human. Such features include; cranium size and the mandibles. However, most remains are usually distorted; hence analyzing the morphology may yield unreliable conclusions. The best conserved fossil of the species is the Ngawi[[22]](#footnote-21), which was discovered in Java.

As the name suggests, the species walked upright. Individuals in the taxon have elongated cranium; endocranially, the typical volume is close to 1000 ml[[23]](#footnote-22). This implies that they had a large brain size. The species tend to have a robust facial skeleton which is projecting in their subordinate parts[[24]](#footnote-23). The *Homo erectus* is considered to have thickened wall openings[[25]](#footnote-24). The species have heavy brow ridges regardless of their gender[[26]](#footnote-25). Their parietal bone is shorter when paralleled with that of modern human beings with a torus at the parietal mastoid position[[27]](#footnote-26). The mandibles of *Homo erectus* do not indicate the presence of a chin bone; they are deeply constructed, and carry a broad ascending ramus[[28]](#footnote-27).

## Outline of the Culture of Homo Erectus

Culture, from a broad-spectrum perspective, refers to the expressions of the intellectual accomplishments of a specific group of people. Such manifestations include areas such as art, clothing, food, customs, and other societal behaviors. Similarly, in this paper, the term culture has been used to give a general description of the life of the *Homo erectus.* The paper gives specific consideration to the food, shelter, and tools of the *Homo erectus.* As it stands, the most significant achievement of the *Homo erectus* that is still being enjoyed by modern humans is the invention of fire[[29]](#footnote-28).

## Shelter

Morphologically, the species has a generally large brain size. As such, the archaeological evidence indicates that the species possessed cognitive abilities[[30]](#footnote-29). This information, therefore, indicates that the *Homo erectus* was more socially developed than their ancestors. Archaeological evidence has shown that the members of the species lived in caves[[31]](#footnote-30). Caves would not only provide them with shelter, but warmth and also served as storage for the hunted game.

## Food

The *Homo erectus*  were hunter-gatherers[[32]](#footnote-31). This brings in the hypothesis that the individuals were omnivorous; feeding on both flesh and plant foods. The fact that the *Homo erectus* discovered fire proves that they ate cooked food, in particular meat as opposed to their ancestors. This means that their diet was much broader compared to their ancestors. The foremost game as, reported by archaeologists is pig[[33]](#footnote-32). Other scientists argue that the *Homo erectus*’ main diet was the elephant[[34]](#footnote-33) which was the main source of fat for the species. Other animals that the *Homo erectus* is considered to have hunted down include; monkeys, deer, porcupine, squirrels, birds, turtles and tortoises[[35]](#footnote-34). Given the above sample of animals, it is obvious that the members of this taxon must have had more sophisticated tools to be able to kill and skin animals especially the pig and elephant. It is imperative to note, however, that the *Homo erectus* did not feed on marine species. The discovery of fire in general, and the subsequent mastery of how to control it was a major milestone for the species.

## Tools

The individuals in this species were relatively smart and knowledgeable. This creates the implication that they were in a capacity to apply a lot of skill when making their tools for efficient and effective hunting. The tools associated with the species are Acheulian tools[[36]](#footnote-35). These are tools were made by bifacial flaking technique[[37]](#footnote-36); their tools were, therefore, two sided. The hand axes, particularly, are considered to have been the main tool in hunting.

## Extinction

Extinction, by definition, refers to the process in which an entire species completely dies out. The point of extinction preferably occurs when the last individual in the species dies, regardless of the time when the species lost the capacity to reproduce. It is a phenomenon that was foreseen by Darwin in his theory of evolution; species need to adapt to the changing environment and those who fail eventually die. The world has changed significantly, although it is imperative to note that the bulk of the hominin species may have failed to identify these changes as time progressed. Therefore, it is argued that given the gradual nature of change, the transition from the *Homo erectus* to modern hominins occurred in an unbroken progression[[38]](#footnote-37). This section will give an overview of the circumstances in which the *Homo erectus* is considered to have died out.

The real question, however, is whether the species simply seized to exist or whether it evolved into a more sophisticated species. Was the change instantaneous, or did it take several generations for a species that is morphologically and culturally distinct from the *Homo erectus* to emerge? The exact dates when the species became extinct are debatable since different scientists posit different dates. Some scientists even suggest that the *Homo erectus* existed as recently as thirty thousand years ago[[39]](#footnote-38). Ideally, the species was quick to adapt to the changes in the environment which serves to explain why it lasted for so long[[40]](#footnote-39). Different theories have been suggested by scientists in a bid to explain the eventual extinction of the *Homo erectus.*

Many scientists hypothesize that the evolution of the shift in human histories was a response to the shift in dietary requirements. Ben-Dor et al argue that since *Homo erectus* was heavily dependent on elephants, their extinction was a big blow to their dietary requirements. The species had a relatively large brain, as was aforementioned. The species, therefore, required a large supply of fat hence the preference for the big game such as the elephant and rhino[[41]](#footnote-40). The big game retained their fat content throughout the seasons unlike the smaller animals[[42]](#footnote-41). Moreover, the big game was easy to track and hunt. When the big game became extinct, the hominin was forced to hunt down smaller animals that had little fat content, which were difficult to track and kill. Moreover, hunting the smaller animals was more exhausting, therefore increasing the Daily Energy Expenditure (DEE) of the species. This means that their need for animal fat consumption increased with the extinction of the big game. As such, Ben-Dor et al argue that the response to these dietary implications automatically led to the extinction of the species, and consequently the emergence of a species that was better equipped to survive in these acute conditions. The new species, they argue, was more knowledgeable, skilled and coordinated[[43]](#footnote-42). This theory tends to lean towards the fact that the transition from one species to another was not instantaneous but rather took several years for the change to be noticed.

This poses another important question; during the transition from *Homo erectus* to *Homo sapiens*, did many lineages occur or was it all part and parcel of the same lineage? One of the greatest debates ongoing is whether the *Homo erectus* was exclusively an Asian species, thus the need to classify the remains found in East Africa into their own taxon, *Homo ergaster[[44]](#footnote-43).* The answer to this response is highly dependent on the perspective that scientists take to explain extinction. Rightmire points out two responses, which as aforementioned, are heavy matters of perspective rather than science. The first argument that he points out is that they are all one lineage regardless of the differences[[45]](#footnote-44). The proponents argue that all species, whether *Homo erectus* or *Homo sapiens* are part of an unbroken evolutionary sequence. The proponents of this approach, therefore, insist that there is absolutely no relevance in classifying species into different taxon and lineages.

A contrary opinion, however, argues that the species carry traits that are relatively distinct from each other morphologically[[46]](#footnote-45). The traits, the argument suggests, give different grades of the extent to which the species was primitive compared to the modern hominin. Another argument is of the opinion that scientists should desist from looking at morphological differences within the same species and adopt a broader outlook instead[[47]](#footnote-46). Classifying fossils with relatively similar morphological traits is a wrong approach, Rightmire argues, since it leads to the eventual overlooking of important features and information[[48]](#footnote-47).

## Conclusion

Given the above analysis, it is difficult to come up with a coherent hypothesis, as most of the information ranging from the dating, moment of extinction, classification and culture is debatable. One perspective is readily refuted by another. As such, it becomes relatively difficult to discern the objective features of the *Homo erectus* in terms of the dating, culture and extinction. Otherwise, it is only the morphology of the fossil remains that is not contested owing to the fact that it is objective; it does not change. Regardless, I am of the opinion that the methods adopted for dating should be revised in future so as to eliminate some of these debates. Moving forward, it is imperative to note that with the continued emergence of archaeological evidence, these debates are likely to exacerbate rather than reduce. The *Homo erectus* species is our immediate ancestor, which creates the implication that the modern man is relatively similar to the species. The changes, which are often manifested in the cranial capacity, skin hair cover, height and facial protrusion may either be ignored or analyzed depending on the standpoint that the analyst is willing to take as indicated herein. Moving forward, I am of the opinion that the species represents a lineage unique to its ancestors and descendants. Therefore, the lumping together of this species with other species is a complete overlook of the relevant traits that make it unique and distinct in its own right.

## Bibliography

Aiello, Leslie C., and Jonathan C. K. Wells. "Energetics And The Evolution Of The Genushomo". *Annual Review of Anthropology* 31, no. 1 (2002): 323-338.

Antón, Susan C., and J. Josh Snodgrass. "Origins And Evolution Of Genushomo". *Current Anthropology* 53, no. S6 (2012): S479-S496.

Asfaw, Berhane, W. Henry Gilbert, Yonas Beyene, William K. Hart, Paul R. Renne, Giday WoldeGabriel, Elisabeth S. Vrba, and Tim D. White. "Remains Of Homo Erectus From Bouri, Middle Awash, Ethiopia". *Nature* 416, no. 6878 (2002): 317-320.

Coqueugniot, H., J.-J. Hublin, F. Veillon, F. Houët, and T. Jacob. "Early Brain Growth In Homo Erectus And Implications For Cognitive Ability". *Nature* 431, no. 7006 (2004): 299-302.

Dennel, R. W. “The Solo (Ngandong) Homo erectus assemblage: a taphonomic assessment”, Archaeol. Oceania, 40 (2005):81–90.

Gibbons, Ann. "African Skull Points To One Human Ancestor". *Accuca.Conectia.Es*. Last modified 2002. Accessed November 26, 2017. http://www.accuca.conectia.es/african\_skull\_points.htm.

Gibbons, Ann. "PALEOANTHROPOLOGY: Ancient Island Tools Suggest Homo Erectus Was A Seafarer". *Science* 279, no. 5357 (1998): 1635-1637.

Higham, Charles. "Hunter-Gatherers In Southeast Asia: From Prehistory To The Present". *Human Biology* 85, no. 1-3 (2013): 21.

Kaifu, Yousuke, Iwan Kurniawan, Daisuke Kubo, Erick Sudiyabudi, Gunawan Pontjo Putro, Endang Prasanti, Fachroel Aziz, and Hisao Baba. "<I>Homo Erectus</I> Calvaria From Ngawi (Java) And Its Evolutionary Implications". *Anthropological Science* 123, no. 3 (2015): 161-176.

Lubenow, Marvin L. "The Dating Gap | The Institute For Creation Research". *Icr.Org*. Last modified 1993. Accessed November 27, 2017. http://www.icr.org/article/dating-gap/.

Peppe, Daniel J., and Allan L. Deino. "Dating Rocks And Fossils Using Geologic Methods | Learn Science At Scitable". *Nature.Com*. Last modified 2013. Accessed November 27, 2017. https://www.nature.com/scitable/knowledge/library/dating-rocks-and-fossils-using-geologic-methods-107924044.

Rightmire, G. Phillip”Homo Erectus and Later Middle Pleistocene Humans”, *Annual Review of Anthropology*, no. 17 (1998): 239-259.

Shen, Guanjun, Xing Gao, Bin Gao, and Darryl E. Granger. "Age Of Zhoukoudian Homo Erectus Determined With 26Al/10Be Burial Dating". *Nature* 458, no. 7235 (2009): 198-200.

Smith, Fred H. "The Evolution of Homo Erectus: Comparative Anatomical Studies of an Extinct Human Species." *Science*, 253, no. 5024 (1991):1151.

Zorach, Zack. "From The Trenches - We Didn't Start The Fire... Homo Erectus Did - Archaeology Magazine Archive". *Archive.Archaeology.Org*. Last modified 2012. Accessed November 26, 2017. https://archive.archaeology.org/1207/trenches/wonderwerk\_homo\_erectus\_south\_africa.html.

1. Leslie C. Aiello and Jonathan C. K. Wells, "Energetics And The Evolution Of The Genushomo", *Annual Review of Anthropology* 31, no. 1 (2002): 323-338. [↑](#footnote-ref-0)
2. Ibid [↑](#footnote-ref-1)
3. Susan C. Antón and J. Josh Snodgrass, "Origins And Evolution Of Genushomo", *Current Anthropology* 53, no. 6 (2012): S479-S496. [↑](#footnote-ref-2)
4. Fred H. Smith, "The Evolution of Homo Erectus: Comparative Anatomical Studies of an Extinct Human Species." *Science*, 253, no. 5024 (1991):1151. [↑](#footnote-ref-3)
5. Ibid [↑](#footnote-ref-4)
6. G. Philip Rightmire,”Homo Erectus and Later Middle Pleistocene Humans”, *Annual Review of Anthropology*, no. 17 (1998): 239-259. [↑](#footnote-ref-5)
7. Ibid [↑](#footnote-ref-6)
8. Ibid [↑](#footnote-ref-7)
9. Ibid [↑](#footnote-ref-8)
10. Ibid [↑](#footnote-ref-9)
11. Ibid [↑](#footnote-ref-10)
12. Ann Gibbons, "African Skull Points To One Human Ancestor", *Accuca.Conectia.Es*, last modified 2002, accessed November 26, 2017, http://www.accuca.conectia.es/african\_skull\_points.htm. [↑](#footnote-ref-11)
13. G. Philip Rightmire,”Homo Erectus and Later Middle Pleistocene Humans”, *Annual Review of Anthropology*, no. 17 (1998): 239-259. [↑](#footnote-ref-12)
14. Ann Gibbons, "PALEOANTHROPOLOGY: Ancient Island Tools Suggest Homo Erectus Was A Seafarer", *Science* 279, no. 5357 (1998): 1635-1637. [↑](#footnote-ref-13)
15. Marvin L. Lubenow, "The Dating Gap | The Institute For Creation Research", *Icr.Org*, last modified 1993, accessed November 27, 2017, http://www.icr.org/article/dating-gap/. [↑](#footnote-ref-14)
16. Ibid [↑](#footnote-ref-15)
17. R.W. Dennell, “The Solo (Ngandong) Homo erectus assemblage: a taphonomic assessment”, A*rchaeol. Oceania*, 40 (2005):81–90 [↑](#footnote-ref-16)
18. Daniel J. Peppe and Allan L. Deino, "Dating Rocks And Fossils Using Geologic Methods | Learn Science At Scitable", *Nature.Com*, last modified 2013, accessed November 27, 2017, https://www.nature.com/scitable/knowledge/library/dating-rocks-and-fossils-using-geologic-methods-107924044. [↑](#footnote-ref-17)
19. Guanjun Shen et al., "Age Of Zhoukoudian Homo Erectus Determined With 26Al/10Be Burial Dating", *Nature* 458, no. 7235 (2009): 198-200. [↑](#footnote-ref-18)
20. G. Philip Rightmire,”Homo Erectus and Later Middle Pleistocene Humans”, *Annual Review of Anthropology*, no. 17 (1998): 239-259. [↑](#footnote-ref-19)
21. Ann Gibbons, "PALEOANTHROPOLOGY: Ancient Island Tools Suggest Homo Erectus Was A Seafarer", *Science* 279, no. 5357 (1998): 1635-1637. [↑](#footnote-ref-20)
22. Yousuke Kaifu et al., "<I>Homo Erectus</I> Calvaria From Ngawi (Java) And Its Evolutionary Implications", *Anthropological Science* 123, no. 3 (2015): 161-176. [↑](#footnote-ref-21)
23. G. Philip Rightmire,”Homo Erectus and Later Middle Pleistocene Humans”, *Annual Review of Anthropology*, no. 17 (1998): 239-259. [↑](#footnote-ref-22)
24. Ibid [↑](#footnote-ref-23)
25. Ibid [↑](#footnote-ref-24)
26. Ibid [↑](#footnote-ref-25)
27. Ibid [↑](#footnote-ref-26)
28. Ibid [↑](#footnote-ref-27)
29. Zack Zorach, "From The Trenches - We Didn't Start The Fire... Homo Erectus Did - Archaeology Magazine Archive", *Archive.Archaeology.Org*, last modified 2012, accessed November 26, 2017, https://archive.archaeology.org/1207/trenches/wonderwerk\_homo\_erectus\_south\_africa.html. [↑](#footnote-ref-28)
30. H. Coqueugniot et al., "Early Brain Growth In Homo Erectus And Implications For Cognitive Ability", *Nature* 431, no. 7006 (2004): 299-302. [↑](#footnote-ref-29)
31. Charles Higham, "Hunter-Gatherers In Southeast Asia: From Prehistory To The Present", *Human Biology* 85, no. 1-3 (2013): 21. [↑](#footnote-ref-30)
32. Ibid [↑](#footnote-ref-31)
33. Ibid [↑](#footnote-ref-32)
34. Miki Ben-Dor et al., "Man The Fat Hunter: The Demise Of Homo Erectus And The Emergence Of A New Hominin Lineage In The Middle Pleistocene (Ca. 400 Kyr) Levant", *PLoS ONE* 6, no. 12 (2011): e28689. [↑](#footnote-ref-33)
35. Charles Higham, "Hunter-Gatherers In Southeast Asia: From Prehistory To The Present", *Human Biology* 85, no. 1-3 (2013): 21. [↑](#footnote-ref-34)
36. Ibid [↑](#footnote-ref-35)
37. Ibid [↑](#footnote-ref-36)
38. G. Philip Rightmire,”Homo Erectus and Later Middle Pleistocene Humans”, *Annual Review of Anthropology*, no. 17 (1998): 239-259. [↑](#footnote-ref-37)
39. Ann Gibbons, "PALEOANTHROPOLOGY: Ancient Island Tools Suggest Homo Erectus Was A Seafarer", *Science* 279, no. 5357 (1998): 1635-1637. [↑](#footnote-ref-38)
40. Ibid [↑](#footnote-ref-39)
41. Miki Ben-Dor et al., "Man The Fat Hunter: The Demise Of Homo Erectus And The Emergence Of A New Hominin Lineage In The Middle Pleistocene (Ca. 400 Kyr) Levant", *PLoS ONE* 6, no. 12 (2011): e28689. [↑](#footnote-ref-40)
42. Ibid [↑](#footnote-ref-41)
43. Ibid [↑](#footnote-ref-42)
44. Berhane Asfaw et al., "Remains Of Homo Erectus From Bouri, Middle Awash, Ethiopia", *Nature* 416, no. 6878 (2002): 317-320. [↑](#footnote-ref-43)
45. G. Philip Rightmire,”Homo Erectus and Later Middle Pleistocene Humans”, *Annual Review of Anthropology*, no. 17 (1998): 239-259. [↑](#footnote-ref-44)
46. Ibid [↑](#footnote-ref-45)
47. Ibid [↑](#footnote-ref-46)
48. Ibid [↑](#footnote-ref-47)