



# HUMAN EVOLUTION IN A NUTSHELL:

AN INTRODUCTION TO HUMAN EVOLUTION

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PART 2.1: THE AUSTRALOPITHECINES OF EAST AFRICA

## PART 2.1: THE AUSTRALOPITHECINES OF EAST AFRICA

In part 1 we looked at humans' closest relatives, the great apes, and the earliest hominins (members of the human family). We saw that the first of the typically hominin features to appear was bipedalism, walking on two legs, and we looked at why this might have arisen.

In part 2.1 you will learn about:

- The initial discovery of the australopithecines
- The australopithecines of East Africa
- The first australopithecine, *Australopithecus anamensis*
- *Australopithecus afarensis*
- Some other early hominins from East Africa

## INITIAL DISCOVERY OF THE AUSTRALOPITHECINES

The earliest hominins have all been found in Africa. This is what Charles Darwin had predicted (without any fossil evidence at the time) for he believed, on anatomical grounds, that our closest living relatives were the African Great Apes. However, in Darwin's time Africa was not widely thought to be the most likely cradle for humankind, with Asia generally being preferred.

### The Taung Child

In 1924 Raymond Dart brought the focus of human origins back to Africa with his discovery of the 'Taung Child' in South Africa (fig. 1). Its features can be summarised as follows:

- Apelike face and brain
- Bipedal
- Central *foramen magnum* (hole for the spine)
- Endocast (fossilised brain cast)
- Would have been a little over three years old at death
- Dated to about 2.8 million years ago



Dart named his find *Australopithecus africanus*, meaning “Southern ape of Africa”.

## Hominin finds from the 1930s and '40s

In the 1930s and '40s a number of finds confirmed that ancient bipedal apes had indeed lived in Africa. Robert Broom and John T. Robinson discovered a number of hominin remains in South Africa.

In 1938 Broom and Robinson discovered the skull and teeth of a hominin at Kromdraai (fig. 2). It was dated to about 2 million years ago. They named it *Paranthropus robustus* (*Paranthropus* meaning 'beside man') because Broom believed *Paranthropus* to be too specialised to be on the main line of human evolution due to having huge teeth.

In 1947 Broom and Robinson discovered a skull known as Mrs Ples (fig. 3), and now considered *Australopithecus africanus*, the same species as the Taung Child. Further finds, including a pelvis, spine, ribs, and femur (thigh bone), showed clearly that it walked on two legs.

We shall now look at other *Australopithecus* finds that show how they were a widespread and diverse group of bipedal apes.



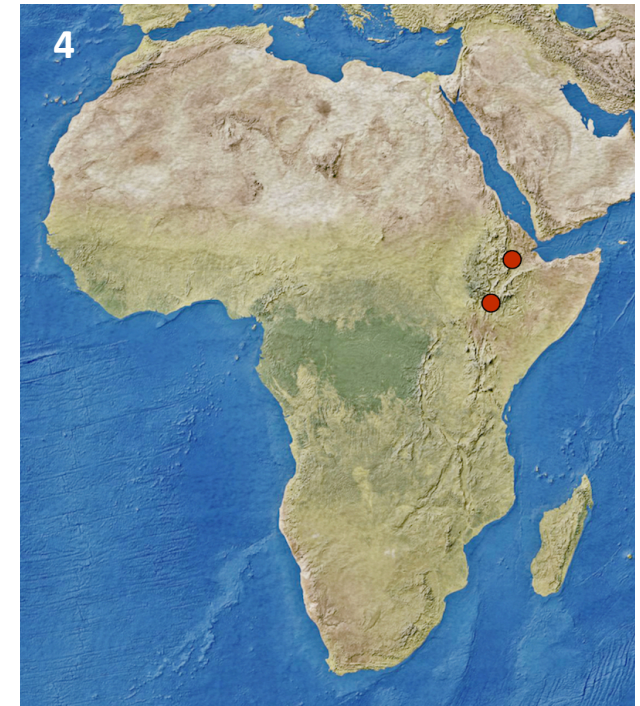
## ***AUSTRALOPITHECUS ANAMENSIS***

The earliest known australopithecine is *Australopithecus anamensis*, which has been dated to 4.2-3.9 million years ago. The first remains were found in the Kanapoi region west of Lake Turkana, Kenya, in 1965 in the form of a fragment of a humerus (arm bone). In the mid 1990s many more finds were found, also near Lake Turkana (fig. 5), and in 2006 in Ethiopia.

A lower jaw was found that was somewhat chimpanzee-like but with teeth that were more human-like (i.e., smaller front teeth and flatter rear teeth with thick tooth enamel). The teeth indicate a diet of nuts, seeds, and other hard, brittle items.

The arm bone demonstrates a strong upper body and good climbing ability. A tibia (shinbone) was found whose form indicates bipedalism.

*A. anamensis* lived in a mixed habitat of woodlands, rivers and open grasslands.





## ***AUSTRALOPITHECUS AFARENSIS***

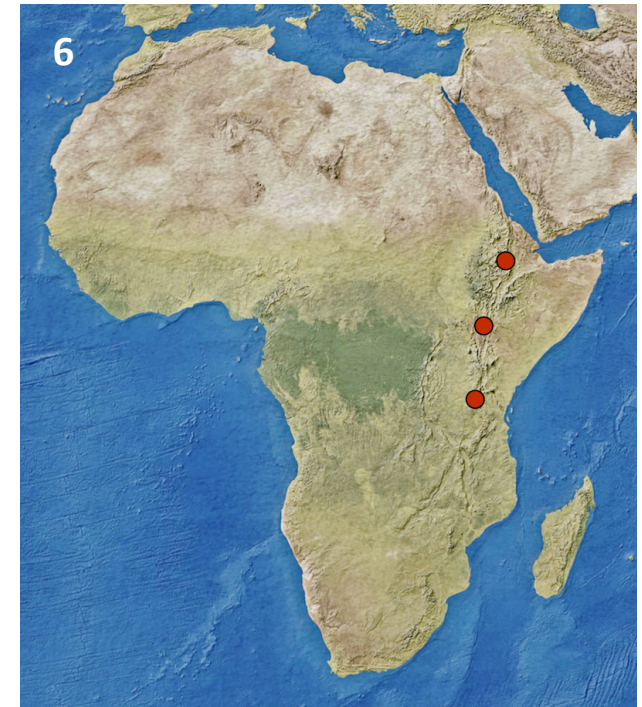
*Australopithecus afarensis* is known from hundreds of individual fossils, so we know a great deal about this species. There are a number of notable finds:

### **Lucy**



Lucy is the 40% complete skeleton of a female found in 1974 near Hadar in the Afar Depression in northern Ethiopia. She is named after the Beatles song “Lucy in the Sky with Diamonds”, which had been playing at the excavation camp, and has been dated to 3.2 ma.

The remains include jaw and skull, arm and leg, pelvis, fingers and toes, vertebrae and ribs. At the time of Lucy’s discovery she was by far the most complete early hominin find.



## The First Family

Found in the same region as Lucy and also dated to 3.2 ma, at least 13 separate individuals were found who may have all died at the same time. They shed light on how an *afarensis* group may have been composed and the difference in size between males and females (or *sexual dimorphism*).

### Laetoli footprints

A trail of footprints was found in ancient volcanic ash, 25 metres long and made by three individuals, two adults and one juvenile. Assumed to be made by *afarensis*, though impossible to prove from footprints. Dated to 3.7 ma.

Skull, jaws and teeth have also been found at Laetoli, Tanzania.

Selam **10**

### Lucy's Baby

Known as Selam (meaning 'peace'), the remains of a juvenile *afarensis* were found in 2000 in Dikika, Ethiopia, near to where Lucy was found. It has been dated to 3.3 ma.

The remains include almost the whole skull, parts of the torso and the upper and lower limbs. It would have been about three years old at death.

Laetoli footprints **9**



## OVERVIEW OF *AUSTRALOPITHECUS AFARENSIS*

It ranged from northern Ethiopia to northern Tanzania and lived from roughly 3.9 – 2.9 ma.

### Skull

It had a chimp-like brain size (400 cc). The snout was pronounced, with no chin (*apelike*). It had relatively small front teeth without the large canines of modern apes and large rear teeth. This suggests a generalised diet of fruits, seeds and nuts, but overall harder foods than what chimpanzees can eat.

### Below the neck

It was a biped as shown by a short, broad pelvis and a knee and femur that were human-like. It also had climbing adaptations, such as long, strong arms and strong, a mobile wrist and curved finger and foot bones. Males were considerably larger than females, perhaps twice the size (45-50 kg), so similar to gorillas.

### Environment

Generally woodland with some wooded dry savannah.





## ***A. anamensis* and *A. afarensis* compared**

It seems fairly clear that *A. anamensis* is ancestral to *A. afarensis* as the two species are fairly similar but with the older *A. anamensis* somewhat more primitive in some regards, for example, having larger, more apelike canine teeth.

## **OTHER EARLY HOMININS FROM EAST AFRICA**

### ***Australopithecus garhi***

Found in 1996 in Afar, Ethiopia and dated to 2.5 ma. A partial skull and leg and arm bones were found (fig. 12). The leg bone (femur) is long and therefore more human-like.



### ***Kenyanthropus platyops***

Found in 1999 at Lake Turkana, Kenya and dated to 3.2 - 3.5 ma. Noted for its small brain size and flat broad face (fig. 13). The teeth have thick enamel and the molars are small. It highlights the diversity of early hominins at this time.

Time to move on to South Africa in part 2.2.



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