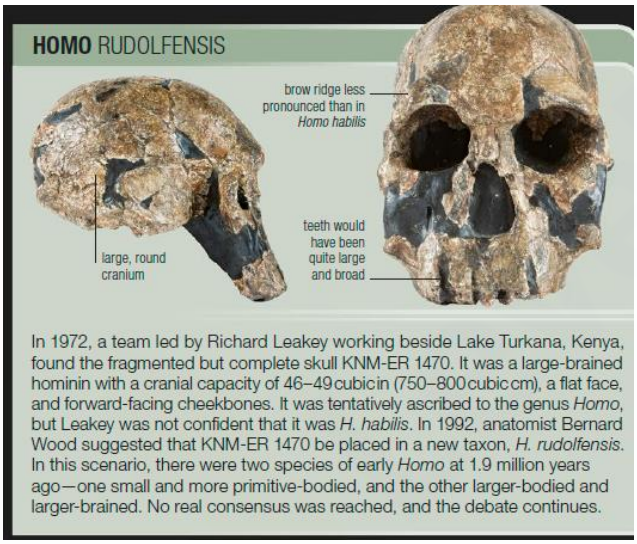
# Homo habilis: The First Species of the Genus Homo

**(THE PATH TO HUMANNESS: BIGGER BRAINS, TOOL USE, AND ADAPTIVE FLEXIBILITY)**

**Defining the Genus Homo**

The first species of genus *Homo* are **not all that different from some *Australopithecus***. A genus name implies a certain adaptive strategy, so that with the switch from *Australopithecus* to *Homo,* you should expect to see a suite of adaptive differences between the two genera. In general, genus *Homo* differs from *Australopithecus* by having a larger, more rounded braincase; a smaller, less projecting face; smaller teeth; and eventually a larger body and shorter arms and perhaps more efficient striding bipedalism. These features may be related to an adaptation that includes more meat and animal fat in their diet, greater ranging, and greater food processing through tool use. However, early members of the genus *Homo* differ less strongly from *Australopithecus* than later members and therefore are harder to distinguish from them.

A team led by scientists **Louis and Mary Leakey** uncovered the fossilized remains of a unique early human between 1960 and 1963 at **Olduvai Gorge in Tanzania**. The type specimen, OH 7, was found by Jonathan Leakey, so was nicknamed "Jonny's child". Because this early human had a combination of features different from those seen in Australopithecus, Louis Leakey, South African scientist Philip Tobias, and British scientist John Napier declared these fossils a new species, and called them Homo habilis (meaning 'handy man'), because they suspected that it was this slightly larger-brained early human that made the thousands of stone tools also found at Olduvai Gorge.



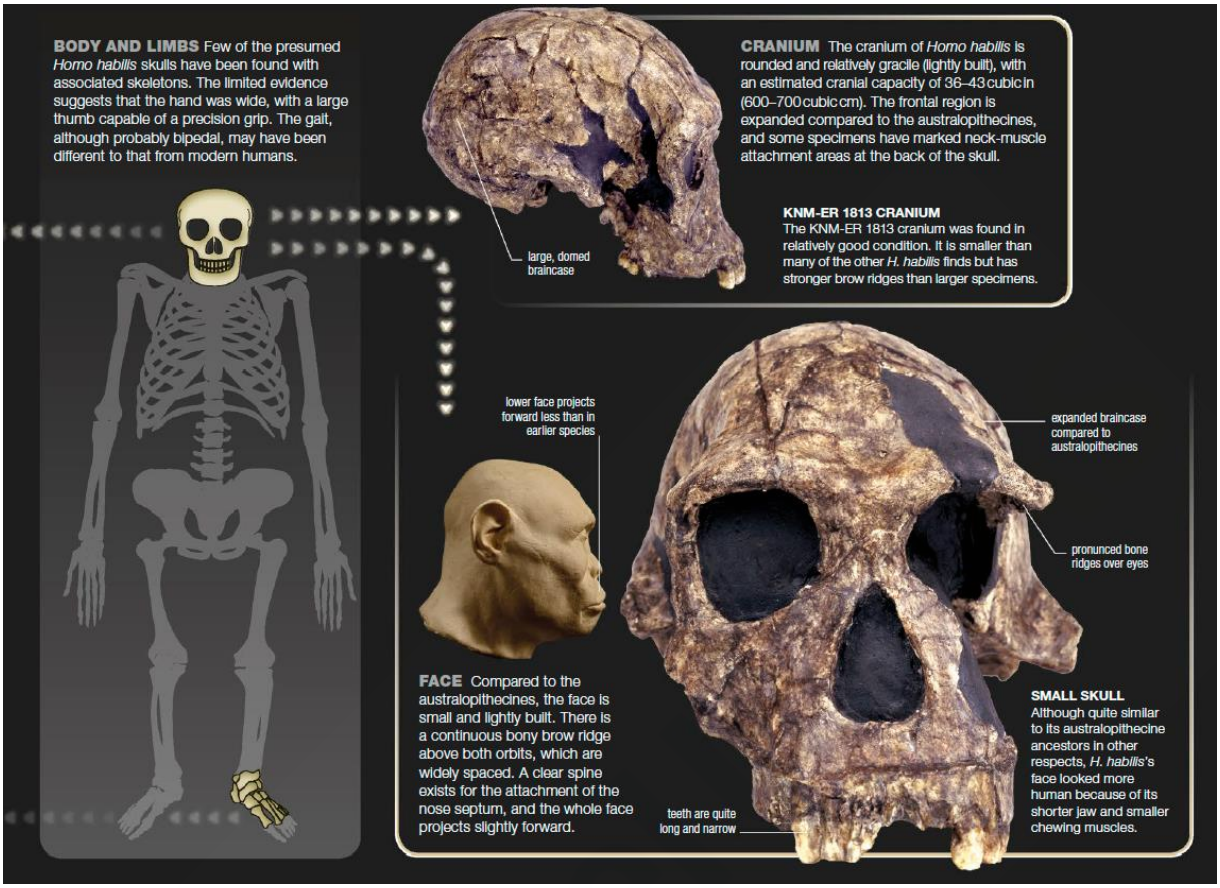

H. habilis is now known from **Tanzania, Kenya, Ethiopia, Malawi, and South Africa**—the same geographic distribution as that of the contemporary australopithecines. H. habilis found on the **eastern side of Kenya's Lake Turkana** is sometimes called **Homo rudolfensis**. The major difference is that H. rudolfensis is somewhat bigger than H. habilis. Because they have the **same general body plan and overall morphology** (bigger brains, smaller faces), here the two species are discussed as H. habilis.

**GEOGRAPHICAL DISTRIBUTION:**

The first fossil of Homo habilis was discovered in Olduvai Gorge (Tanzania) by Mary Leakey in 1960-61. Homo habilis is now known from Tanzania, Kenya, Ethiopia, Malawi, and South Africa—the same geographic distribution as that of the contemporary australopithecines. In the early 1970s at Koobi Fora on the eastern shore of Lake Turkana, Richard Leakey's team discovered a more intact skull of H. habilis, which is approximately 1.8 million years old.

Additional finds of H. habilis from Koobi Fora range in geological age from about 1.4 to 1.9 million years old and **vary greatly in size**. Excavations at Olduvai Gorge in the 1980s by Donald Johansson and Timothy White led to the discovery of a very fragmentary, but important, skeleton of H. habilis, known as "OH 62." The skeleton is from an individual who was short—about three and a half feet—like the australopithecines. Also like the australopithecines, this individual had short legs in comparison with

the arms. Although H. habilis walked bipedally, these short legs would not have been involved in the kind of efficient striding performed by living people. The gait would have been shorter.

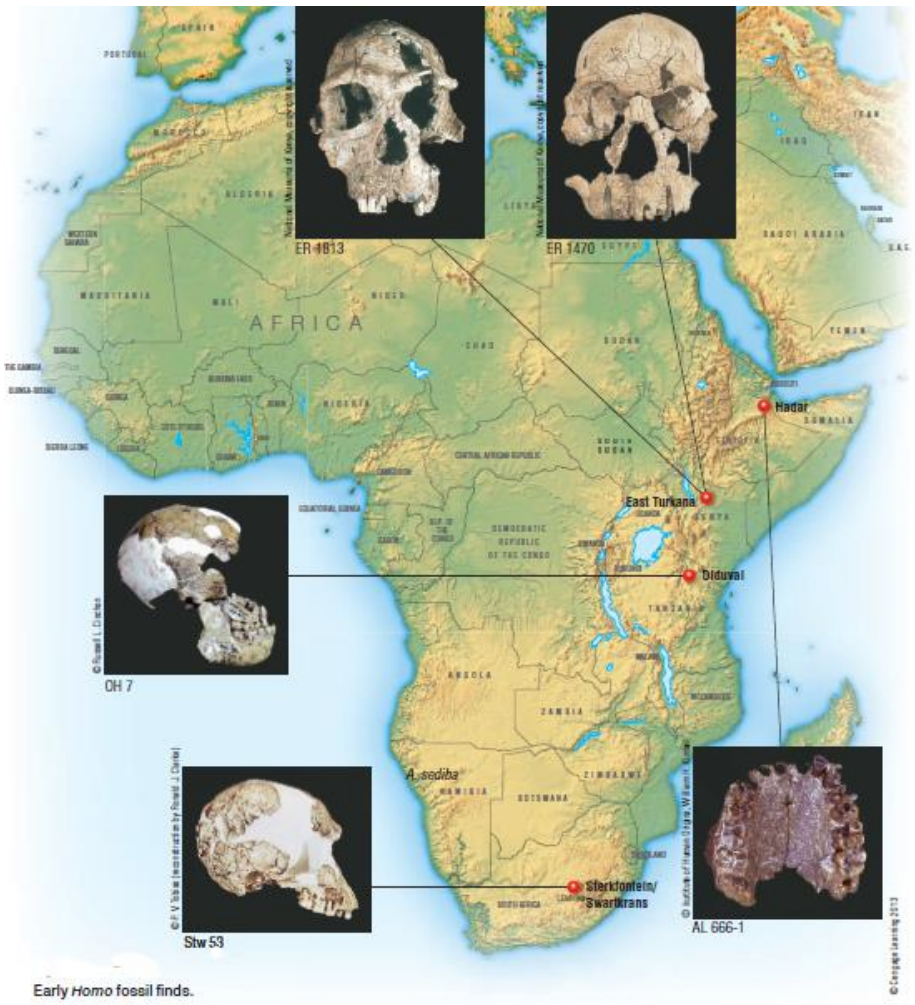



Leakey and his associates recognized, H. habilis differs in its anatomy from the robust australopithecines dating to about the same time in East Africa and South Africa. P. boisei had an enormous chewing complex—its back teeth, jaws, and face were very large—but it had a small brain. In sharp contrast, H. habilis had a smaller chewing complex and a larger brain. Combined, the reduced chewing complex and increased brain size gave H. habilis's skull a more rounded, or globular, appearance. Most anthropologists agree that these attributes indicate that H. habilis began the lineage leading to modern humans.

Bernard Wood and many others think that the differences between the largest and smallest Koobi Fora early Homo crania are too great to fall within the variation of a single species. The smallest has a brain almost one-third smaller (only 510 cc) than the largest specimen, smaller teeth, and a differently proportioned face. He placed those fossils with the smaller-brained under H. habilis. They are those with narrower faces, narrower jaws and smaller grinding teeth and the skull features are said to be Homo like.

Those found on the eastern side of Kenya's Lake Turkana are sometimes called Homo rudolfensis. The major difference is that Homo rudolfensis is somewhat bigger than Homo habilis. They are specimens with broad faces, heavy jaws, large grinding teeth and the skeletal features like those of A. afarensis (Lucy)

Because they have the same general body plan and overall morphology (bigger brains, smaller faces), here the two species are discussed as Homo habilis. (For UPSC)

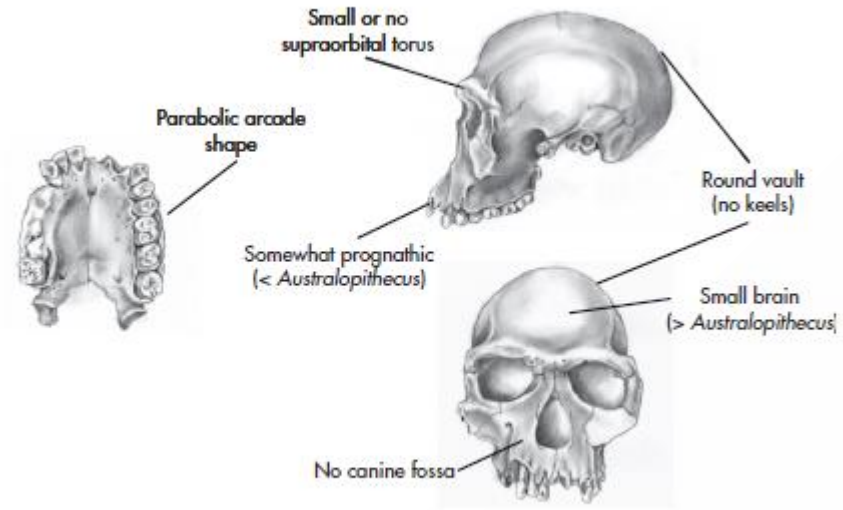


Early *Homo* fossil finds.

## CHARACTERISTICS OF HOMO HABILIS

**BIOLOGICAL CHARACTERISTICS:**

1) It was short and had disproportionately long arms compared to modern humans.
2) It had less protruding face than Australopithecines, from which it is thought to have descended.
3) It had cranial capacity slightly less than half the size of modern humans. But have more cranial capacity than Australopithecus.
4) When compared to Australopithecus they had
   (a) Developed frontal bones
   (b) Reduced brow ridges
   (c) Reduced lower jaw
5) Dental Arcade was more parabolic than Australopithecus.
6) Digits of hands are similar to monkeys and apes.
7) Character's like structure of hand, teeth, the position of great toe with other toes are similar to that of modern man.
8) Most experts assume that the intelligence and social organization of habilis were more sophisticated than Australopithecus.




Key anatomical features of *Homo habilis* include reduced facial size, a parabolic palate, and some brain enlargement.

**CULTURAL CHARACTERISTICS**

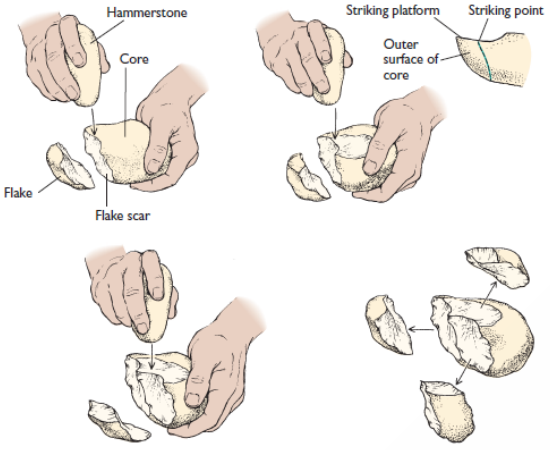
Palaeolithic culture began with the appearance of Homo habilis. Homo habilis first appeared in the fossil record around 2 million years ago in lower Pleistocene. For about 1 million years Homo habilis existed along with Australopithecus. And hence both were contemporary to each other for some period. Several fossils have been excavated from different sites. All these sites and materials reveal that Homo habilis population lived in similar climates i.e. Subtropical savannas near streams and lakes. The subtropical savannas were full of grasses which yield grains, a variety of trees which provide seeds and several types of plants that supply roots and tubers. Further the grass provided good pasture grounds for a number of animals, both small and large. Therefore, Savannas supported a great deal of meat in diet. Living in such climates they made tool and erected bipedally, which is a new adaptive character.

**TOOL MAKING**

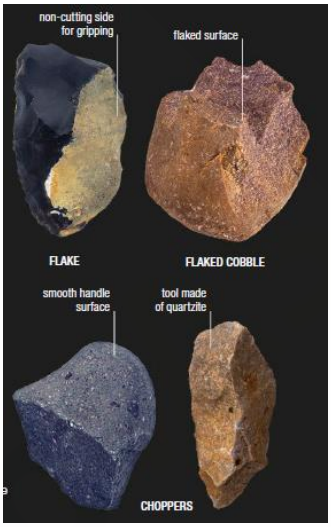
The earliest tools are known as the **Oldowan** industry, so named for their first discovery at Olduvai Gorge in Tanzania. We refer to stone tools made in a particular way or tradition as a **tool industry**. Oldowan tools consist mainly of **cores,** lumps of stone, often river cobbles modified from the original rock by flaking pieces off it, and **flakes,** the small fragments taken from the core.

Authorities originally thought that the Oldowan tools were all **core tools** and that the flakes were the waste products of their manufacture. However, it has been shown that the majority of cores were the raw materials for the manufacture of **flake tools,** which were used for a variety of tasks, such as cutting meat and plant material, scraping meat off a bone, and sawing wood or bone (Schick and Toth 1993; Toth 1985).

Flakes can be extremely sharp and are effective at cutting through tough animal hides and removing meat from bones. Other Oldowan tools called **hammerstones** were used to crack open the bones of large animals to extract marrow and to remove flakes from cores. Oldowan tools are deceptively simple in appearance; if you held one you might not be sure whether it was human-made or naturally created. However, archaeologists, some of whom are proficient stone tool-makers, can distinguish human manufacture patterns from natural breakage of stone.




Process of removing flakes from a stone core in the Oldowan tradition. A hard stone was struck in just the right locations to remove sharp, thin flakes.




Tool-making was first and foremost an adaptation to the environment of the late Pliocene. Through the use of tools, hominins could eat animal meat and access fat resources in their bones. The use of animals as food became an increasingly important adaptive strategy for early humans.

Archaeologists specializing in the study of stone tools have categorized the patterns of tool use at various Oldowan sites in East Africa. Some of these are believed to have been **butchering sites:** A variety of mammal bones, some with direct evidence of butchering, such as cut and percussion marks, are found in association with stone tools. One such site at Olduvai Gorge contains the remains of a hippo with cut marks on its bones along with scores of flakes, suggesting the hippo had been butchered. Some sites, where stone implements are found in great abundance, are **quarrying sites(**An archaeological site at which there is evidence that early hominins were obtaining the raw material to make stone tools.**),** where hominins went to obtain the raw material for the tools. A third type of site is what the archaeologist Glynn Isaac (1978) called a **home base.** Isaac hypothesized that hominins repeatedly brought butchered carcasses back to a central place, possibly with a particular amenity such as a shade tree or a water source nearby, where they slept and ate in greater safety than at the site where the animal was killed. At such a home base, the hominins would have been manufacturing or refining tools as well. Other archaeologists are skeptical of this idea, arguing that natural processes, such as movement of remains by water, wind, and animals, may account for what look like human-created bases of activity.

**Hunting and scavenging**

The earliest hominins almost certainly ate most of the same foods that modern apes eat: fruit, leaves, seeds, insects, and some animal prey. The first indisputable evidence of animal foods is stone tool use for carcass butchery (based on cut marks on fossilized bones of antelope), probably by earliest genus *Homo.*

With the availability of sharp stone tools, animal foods became an important adaptive strategy for early Homo. The first indisputable evidence of tool use for getting animal meat is from the cut marks on fossilized bones of antelope about 2.5 million year ago. However, despite the enormous amount of evidence of meat eating in the form of butchered bones, we don't know how often early Homo

might have eaten meat or how important meat was in their diet. How they get those meats? Do they hunt or scavenged? There are three probable models on how they acquired carcasses:

- **Active hunting**: group of early Homo might have courageously attacked and slaughtered large and dangerous game.
- **Confrontational scavenging:** Large and dangerous game may be hunted down by large predators such as saber-toothed cats. Early Homo might have bravely fought off these predators to gain access to significant amount of meat.
- **Passive scavenging:** Early Homo might have patiently waited till the large predator who hunted down the big game left the carcasses after they finish eating to get a few scraps of meat and fat.

Analyzing some of the cut marks on fossilized carcasses it is evident that carnivores first chewed and butchered later. Bone from Olduvai site show cut marks by the gnawing of contemporaneous lion, hyena, etc. and on top of that early Homo's cut marks were found. This inferred that early Homo eats flesh from the bone after it had already been chewed by predators. So, at least occasionally early Homo scavenge but not hunt. Lewis Binford (1985) found that most of the bones belongs to the lower legs of antelopes where little flesh/meat was attached. This may be the left over part of the carcass after carnivores have finished eating. So, they might have cut through the bone to get nutritious marrow inside.

**Food Gathering**

The prehistoric evidence at some sites indicates that Homo habilis was also a food-gatherer. Stone tools could have been used to crush, chop and pound tough foods such as roots. Ethno-archaeological interpretations reveal that the Homo habilis women and children gathered roots, nuts, berries, seeds, fruits while men would have scavenged (particularly because in some of the traditional societies that are most vaunted for the man's role in hunting, up to 85% of the protein obtained by a household comes not from men but from women gathering foods such as nuts, tubers, and small animals).

**CONCEPT CHECK**

## *Homo habilis:* The First Member of Our Lineage

*Homo habilis* was the first hominid to have anatomical and behavioral characteristics that foreshadowed the evolution of *Homo sapiens:* greater intelligence, reliance on tools, and dietary and behavioral flexibility.

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| **LOCATION/SITES** | Africa (Olduvai Gorge, Lake Turkana, Middle Awash, Omo, Uraha, Sterkfontein) |
| **CHRONOLOGY** | 2.5–1.8 mya |

**BIOLOGY AND CULTURE (COMPARED WITH AUSTRALOPITHECINES)**

| FEATURE | EVIDENCE | OUTCOME |
|---|---|---|
| Tool use (Oldowan) | Skulls<br>Teeth | Smaller face and smaller jaws<br>Reduced size |
| Intelligence | Brain size | Increase (to 650 cc) |
| Diet (scavenging, plant collecting) | Plants available<br>Body size | Perhaps more generalized<br>No significant change |
| Locomotion | Leg length:arm length | No significant change |

**PHYLOGENETIC STATUS**

Homo habilis is thought to be ancestor of erectus which finally gave rise to Homo sapiens. Homo habilis existed with other bipedal primates, such as Paranthropus bosei. However possibly due to its early tool innovation and less specialised diet H. habilis became the precursor of an entire line of new species whereas P. bosei and its robust relatives disappeared.