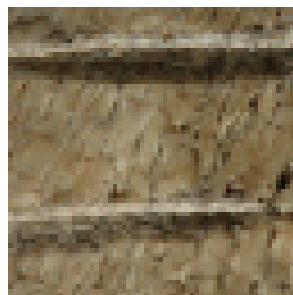
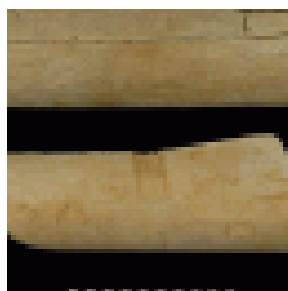


# 'Lucy' species used stone tools, fossil study says

By MALCOLM RITTER, AP Science Writer



In a 2009 photo provided by the Dikika Research Project, project leader Dr. Zeresenay Alemseged excavates a freshly found 3.4 million years old Rhino fossil of a species that lived at the same time and place where the *Australopithecus afarensis* butchered carcasses using stone tools.



Two ancient animal bones from Ethiopia show signs of butchering by human ancestors, moving back the earliest evidence for the use of stone tools by about 800,000 years, researchers say.

The bones appear to have been cut and smashed some 3.4 million years ago, the first evidence of stone tool use by [Australopithecus afarensis](#), the species best known for the fossil dubbed "Lucy," says researcher [Zeresenay Alemseged](#).

"We are putting stone tools in their hands," said Alemseged ("Uh-lem-suh-geh") of the California Academy of Sciences, who reports the finding with colleagues in Thursday's issue of the journal Nature.

Some experts urged caution about the study's conclusions.

The study authors said the bones indicate the human ancestor used sharp stones to carve meat from the carcasses of large animals and other stones to smash bones to get at the marrow. One bone is a rib from a creature the size of a cow, and the other a leg bone from something the size of a goat. No stone tools were found at the site.

The researchers also called the finding the earliest evidence for meat-eating among hominins, an evolutionary group that includes people and their ancestors.

The study authors attributed the tool use to afarensis because no other hominin is known from that time in the area where the bones were found. The skeleton of a young afarensis female, dubbed "Selam," had previously been found about 200 yards away from the bone site. The Lucy fossil, which dates to 3.2 million years ago, was discovered in the same general area in 1974.

Alemseged said afarensis probably scavenged carcasses rather than hunting live animals, and ate the meat raw. The researchers said it's not clear whether the stone tools were made or were simply stones that were used as tools. But they plan to look for evidence of tool-making.

Alemseged also said that as some afarensis stripped meat from a carcass, others probably stood guard to ward off predators in return for some of the meat, which would indicate a degree of cooperative behavior.

Until now, the earliest sign of tool use dated to about 2.6 million years ago, also in Ethiopia. It's not clear who used those tools.

Some experts were unconvinced by the Nature paper's arguments.

"I'm very cautious about the conclusions," said Nicholas Toth of [Indiana University](#), a paleoanthropologist who studies early stone tools.

The bones were found on the surface rather than being excavated, he said. That means nobody knows exactly what layers of earth they came from, which is key to knowing their age and associating them with other bones and materials to give them context, he said.

What's more, judging from photos in the Nature paper, the bone markings differ from the marks typically left by stone tools, he said. That raises questions about whether they were actually caused by trampling or animal bites, Toth said.

In fact, those markings look like the work of crocodiles, said Tim White of the [University of California, Berkeley](#). And they don't appear in the places on the bones that one would expect from a butchering, he said.

He also said that 30 years of searching has failed to find any stone tools as old as the bones. "It's not like people haven't been looking. People have been looking intensively," he said.

"An extraordinary claim requires extraordinary evidence," White said. "The evidence is very thin here, and very ambiguous."

But Bernard Wood of [George Washington University](#) declared, "I'd be willing to bet a month's salary that those are cut marks (from stone tools) and not tooth marks."

Wood compared the find to the famous 1978 discovery of tracks in Tanzania that showed upright walking 3.6 million years ago, most likely by afarensis.

The bone markings "are as significant a statement about early hominin behavior as the [Laetoli footprints](#) are about hominin locomotion," Wood said. While it's reasonable to assume that afarensis wielded the tools, he said, Alemseged's ideas about the butchers being guarded by other afarensis in exchange for meat is "pushing the envelope a bit far."

Wood also said the finding suggests afarensis ate meat but doesn't prove it, because maybe they cut off animal flesh just to get to the marrow.

# TIME

## Study: Lucy's Relatives Used Tools to Butcher Meat

August 11, 2010

By [Michael D. Lemonick](#)



*Reconstruction of the skeleton of Lucy (Australopithecus afarensis), world famous fossil hominid aged 3.2 million years, discovered in 1974 in a dried up lake near Hadar.*

*Christophe Boisvieux / Corbis*

The myth that humans are the only tool-wielding animals was laid to rest long ago: Chimps, otters and even birds use sticks and stones to leverage their innate abilities. But like so many other attributes we share with other creatures — including communication, thought, emotion and social behavior — we take tool use to an entirely different level.

Starting millions of years ago, the evolutionary ancestors of humans figured out how to use primitive stone tools in a systematic way. For example, they learned how to butcher large animals, which gave them access to a source of food their primate cousins couldn't touch. That's what may have fueled the growth in their brain size, which led eventually to modern humans. ([See TIME's video: Animal Intelligence: How Birds Learn to Use Tools.](#))

Exactly when that leap took place has never been pinpointed, but the oldest evidence of stone tools has dated back to about 2.5 million years ago — at least until now. In a new paper, released Wednesday by the journal *Nature*, Zeresenay Alemseged, an anthropologist at the California Academy of Sciences, and several colleagues say they have pushed that milestone back 800,000 years. Two animal bones, excavated in Dikika, Ethiopia, bear what the authors call "unambiguous stone-tool cut marks for flesh removal and percussion [i.e., smashing] for marrow access."

In other words, some species of human ancestor — likely *Australopithecus afarensis*, whose best known representative is 3.2-million-year-old Lucy, the authors say — not only had a hankering for meat, which scientists had not expected, but used tools to get it. That demonstrates cleverness, says Alemseged. It also shows that the butchers were capable of complex social behavior. "They're sharing the landscape with dangerous scavengers such as hyenas," he says, "and so some would have had to serve as lookouts." And because that landscape bore only pebbles, not rocks, they would have had to carry the stone tools several miles before using them. ([See a portfolio of smart animals.](#))

The marks were evident as soon as the bones came out of the ground — one from a large, hoofed mammal about the size of a cow, the other from a goat-size antelope. "The [marks] were clearly v-shaped, which potentially indicated that they were made by tools," says Alemseged.

He and his fellow excavators used a scanning electron microscope to take a closer look. Sure enough, the grooves in the fossilized bones bore fine striations running in the same direction as the cuts themselves — the hallmark of deliberate cutting. The scientists even found a tiny fragment of the tool itself, embedded in one of the cuts. Chemical analysis showed that "it was clearly embedded before deposition," says Alemseged, which rules out a random piece of grit having worked its way into the groove later on. ([See TIME's video: How Animals Learn Language.](#))

Fortunately for the researchers, the bones were buried in sediments whose age was easily determined; based on a relatively straightforward analysis, the fossils can be dated to between 3.24 and 3.42 million years old, and probably closer to the latter. Because the only hominin known to have lived in that area back then was *A. afarensis*, the anthropologists believe that's the species that used the tools.

Whether *A. afarensis* actually fabricated their scrapers or simply used sharp rocks they found lying around is much less clear, since the tools themselves haven't been found. That's not surprising, Alemseged says. "The earliest stages of tool use will probably be less widespread, more erratic," he says.

Alemseged argues that anthropologists should be doing more systematic surveys for animal fossils of this vintage, to uncover further evidence of butchery. Typically, anthropologists look for animal bones only to determine what species of creatures co-existed with human ancestors. But since the two bones Alemseged's team found would not have been useful for that purpose, "you probably wouldn't collect them," he says. "But we made an effort to collect all the bones we found. We need to replicate that strategy, and urge others to do the same."

<http://www.time.com/time/health/article/0,8599,2009968,00.html#ixzz0wLa85uOe>



## Tool usage came before big brains? Cuts on bone found

August 11, 2010



Project leader Dr. Zeresenay Alemseged excavating a freshly found 3.4 million-year-old rhino fossil of a species that lived at the same time and place where the *Australopithecus afarensis* butchered carcasses using stone tools.

by [Dan Vergano](#), USA TODAY

Butcher, the oldest profession? Cut marks on buffalo and antelope bones from 3.4 million years ago, reported by paleontologists Wednesday, suggest our ancestors knew their prime cuts early on.

The *Nature* journal report from Ethiopia's Dikika fossil site moves the earliest recorded tool use back some 800,000 years. The bones were found close to where scientists earlier discovered a fossil for *Australopithecus afarensis*, the species made famous by the 3.2-million-year-old skeleton of Lucy. The connection suggests human ancestors used tools and ate meat long before they evolved big brains.

### SCIENCE FAIR: [Cannibal cavemen of Spain uncovered](#)

Led by Shannon McPherron of Germany's [Max Planck Institute for Evolutionary Anthropology](#), the team reports that electron microscope scans confirm the cut marks on the fossilized ribs conform to marks left by stone blades. Cracks match stone hammer blows made to suck the marrow from bones.

"The picture is really transformed," says discovery team chief Zeresenay Alemseged of the [California Academy of Sciences](#) in San Francisco. "We thought that they were vegetarians who ate leaves and fruits."

Afarensis had a brain a third the size of modern humans'. Textbook views that our "hominin" ancestors first evolved large brains and then tools "are just blown up," says paleoanthropologist Bernard Wood of [George Washington University](#) in D.C., who was not part of the discovery team. "This pushes tool-using behavior to a much earlier time."

Most likely, Afarensis used stone blades opportunistically to cut meat, Wood concludes, rather than carrying them like more recent pre-human species. "It's not rocket science, using a sharp stone blade," Wood says.



## Scientists report finding earliest tools

David Perlman

Wednesday, August 11, 2010

**(08-11) 16:38 PDT SAN FRANCISCO** -- A [San Francisco](#) anthropologist and his international research team report to have found evidence in the harsh Ethiopian desert that human ancestors used stone tools to cut and smash animal bones for meat and marrow nearly a million years earlier than previous fossil evidence has shown.

The find would mean that pre-humans were already using stone tools when the famed "Lucy" - whose fossil skeleton was found in the same region 36 years ago - was alive in that region, suggesting she and her species could have been the world's first tool users.

Deep cut marks in the fossilized bones of two mammals and splintered fragments provided clear evidence of the early stone-tool use, reported [Zeresenay Alemseged](#), curator of anthropology at the California Academy of Sciences, and his team of researchers. Those marks could only have been made by those long ago hominids using sharp stones to cut and smash the bones to gather meat and marrow for food, Alemseged said.

But the report, published Thursday in the journal *Nature*, has generated a rash of skeptical comments from other anthropologists who have worked in the same fossil-rich region and pointed out that the research team found no stones near their discovery site; the closest stones were nearly four miles away.

"Overall the team offers a tantalizing find, but they haven't found the tools," Richard N. Potts, a paleoanthropologist and director of the [Smithsonian Institution's Human Origins](#) Research Program, wrote in an e-mail. "Where are the rocks that could have been used as tools? The burden of demonstrating tool use, in my view, has not been fully met."

Sileshi Semaw, an anthropologist at [Indiana University's Stone Age Institute](#), also criticized the report. Semaw, working in the nearby Gona region of the Afar desert in 2006, discovered a cache of chipped and flaked stone tools, which at 2.6 million years old have since been considered the oldest such implements used by pre-humans.

"The researchers are making a huge claim based in very meager data," he said in an e-mail. "The fact that no single sharp-edged flaked stone has been recovered from the site makes such a claim doubtful of any hominid involvement. I am not convinced of the new discovery."

Alemseged's team maintains that biochemical tests and examination under powerful microscopes clearly established that the grooves in the fossil bones could not come from the slashing teeth of larger predatory animals. Nor were they pulverized by the trampling hooves or feet of huge animals like prehistoric elephants or rhinos, he said.

In an interview, Alemseged described how he and his team had marked off and meticulously surveyed a hillside area in the Dikika region of the Afar desert to collect every tiny scrap of fossil material.

They found fossil teeth from crocodiles and scores of many animals plus bits of all kinds of bone. And then came what Alemseged called the team's "wow moment" - the unearthing of two separate fossil bones with deeply grooved cut marks and pulverized fragments; one was part of a rib from a hoofed animal about the size of a cow, and the other the thigh bone of a smaller goat-sized beast.

Alemseged said the cut-marked bones are "surely older" than 3.39 million years old, from a time when the Afar region was a lush with grasslands, bushes, waterways and lakes.

He said his team's findings "will mark the first major shift in our picture of how and when humans evolved and changed their environment."

"It will call for the revision of all our textbooks," he said, "and while we can't say that our very early ancestors actually made the tools they used or whether they accidentally found the sharp stones, the fact that they used them as tools is a crucial step forward."

At [UC Berkeley Tim D. White](#), the discoverer of 4.4 million-year-old [Ardipithecus ramidus](#), or "Ardi," in the Afar desert, doubted the Alemseged team's claim.

"The evidence for it is weak and ambiguous," he said. "The marks are better matches for experimental bone damage made by crocodiles feeding on antelope carcasses. Even the so-called cut marks selected by these authors are ambiguous and none of them are typical of cut marks made by hominid butchery with stone tools during any time period."

## Tool-making and meat-eating began 3.5 million years ago

By Jason Palmer

August 11, 2010

Researchers have found evidence that hominins - early human ancestors - used stone tools to cleave meat from animal bones more than 3.2 million years ago.

That pushes back the earliest known tool use and meat-eating in such hominins by more than 800,000 years.

Bones found in Ethiopia show cuts from stone and indications that the bones were forcibly broken to remove marrow.



NATURE

The research, in the journal *Nature*, challenges several notions about our ancestors' behaviour.

The bones belonged to a goat-sized

and a cow-sized animal

Previously the oldest-known use of stone tools came from the nearby Gona region of Ethiopia, dating back to about 2.5 million years ago. That suggests that it was our more direct ancestors, members of our own genus *Homo*, that were the first to use tools.

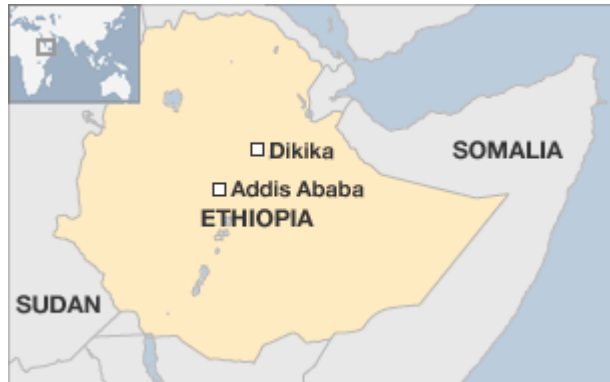
But the marked bones were found in the Dikika region, with their age determined by dating the nearby volcanic rock - to between 3.2 million and 3.4 million years ago.

A battery of tests showed that the cuts, scrapes and scratches were made before the bones fossilised, and detailed analysis even showed that there were bits of stone lodged in one of the cuts.

## In Lucy's hands

The only hominin species known from the Dikika region at that time was *Australopithecus afarensis*, the species represented by the famed "Lucy" fossil, and one that is hypothesised to be a direct ancestor of *Homo* and therefore of us.

But Lucy and her contemporaries were thought to be vegetarians, and many had assumed that tool use arose only in later, *Homo* species.



Study co-author Zeresenay Alemseged, the palaeoanthropologist from the California Academy of Sciences in San Francisco who leads a large research effort in the region, said that the find overturns much of what was thought about *A. afarensis*.

"For 30 years, no-one has been able to put stone tools in their hands, and we've done that for the first time," he told BBC News.

"We are showing for the first time that stone tool use is not unique to *Homo* or *Homo*-related species - we have *A. afarensis* now behaving like *Homo* in a way both by using tools and eating meat. It's another attribute that could enable us to link *A. afarensis* to the genus *Homo*."

The conclusions, however, are based on a small number of bones, and the inference of stone tool use is made indirectly: no tools were actually found at the site. That means it remains unclear if *A. afarensis* actually made the tools from larger bits of stone, or simply used sharpened fragments that were found.

## 'Big story'

Both Alemseged and Shannon McPherron, an archaeologist from the Max Planck Institute of Evolutionary Anthropology in Leipzig, Germany, and lead author of the study, say that the next task is to return to the region and keep looking for evidence to tie up the story.

They hope to establish that it was in fact *A. afarensis* that used the tools, rather than any other species that has not yet been found in the region.

"It's always hard to associate a behaviour with a particular hominin," Dr McPherron explained to BBC News.

"We're never so lucky as to find a hominin dead with the archaeology in its hand."



Analysis showed the cuts were definitely made by stone, not scavengers

But more than that, the team want to look for tools and any potential evidence of their manufacture, to find what kind of tools the *A. afarensis* butcher actually had.

The previous record-holders for oldest stone tools seemed relatively advanced, Dr McPherron explained, so experts have guessed for some time that less sophisticated tools would be found.

"What we can now think about is a fairly extended period of time when these hominins were experimenting with stone, perhaps using naturally occurring flakes," he said.

"But at some point they would've started to make their own. What we need to do is fill in that time period."

Chris Stringer of the Natural History Museum in London cautions against making firm conclusions about the development of tool use, given the limited number of artifacts from the current find.

"We have to be cautious that these are just a couple of bones with what seem to be cut marks on them; one would like to have stone tools associated with them to really clinch the case," he told BBC News.

However, he agrees that pushing the first known date of tool use back by nearly a million years is, regardless, "a big story".

"It suggests that meat-eating and butchery behaviour is pre-human - it's an ancestral behaviour and as such it gives an interesting perspective on the Australopithecines that we didn't have before," he said.

"They seemed to be vegetarian and lacking significant aspects of human behaviour, and in a sense this would bring them somewhat closer to us."

## **Ape-like humans 'used stone tools'**

Wednesday, 11 August 2010

### **Bone fragments bearing the oldest known evidence of stone tool use**

Ape-like humans were cutting up meat with stone blades more than three million years ago, long before the earliest previous evidence of tool use, scientists have revealed.

The discovery of fossil animal bones bearing butchery marks pushes back the known history of tools by almost a million years.

The creatures who wielded the implements pre-date the evolution of the Homo primate family to which modern humans belong.

Previously, it was believed intelligent tool use only started with the emergence of the Homo genus.

Now it is known that a much more primitive ancestor, Australopithecus - which resembled an upright walking ape - understood how to use blade-like stones to strip meat off bones.

Whether it manufactured the tools or used conveniently ready-made stones with sharp edges is not yet known.

Dr Zeresenay Alemseged, from the California Academy of Sciences in the US, who led the researchers responsible for the find, said: "This discovery dramatically shifts the known timeframe of a game-changing behaviour for our ancestors.

"Tool use fundamentally altered the way our early ancestors interacted with nature, allowing them to eat new types of food and exploit new territories. It also led to tool making - a critical step in our evolutionary path that eventually enabled such advanced technologies as aeroplanes, MRI (body scanning) machines, and iPhones."

"This find will definitely force us to revise our text books on human evolution, since it pushes the evidence for tool use and meat eating in our family back by nearly a million years.

"These developments had a huge impact on the story of humanity."

# Bloomberg Businessweek

## Discovery Moves Use of Stone Tools Back 800,000 Years

*Team found evidence of two animal bones that had been marked by eating tools*

By Amanda Gardner

August 11, 2010

WEDNESDAY, Aug. 11 (HealthDay News) -- Scientists excavating in Ethiopia have come across bones from a cow-sized animal and an antelope, probably eaten by early human ancestors, that seem to have been dug out by tools -- probably to get the nutritious marrow out.

The bones are dated to about the time of *Australopithecus afarensis*, or the famous "Lucy" and her kin, which effectively moves back the date of the first known use of stone tools by hominins by almost a million years, from about 2.6 or 2.5 million years ago to 3.4 million years ago.

"The most obvious [value of the discovery] is that it pushes our knowledge of stone-tool use in the hominid lineage 800,000 years earlier than anything we previously knew," said Jeffrey T. Laitman, distinguished professor and director of anatomy and functional morphology and of gross anatomy at Mount Sinai School of Medicine in New York City. "This is a quantum leap in our knowledge."

The discovery changes the known evolutionary history of humans, said Zeresenay Alemseged, co-author of a paper on the discovery published in the Aug. 12 issue of *Nature*.

Not only must the record be changed to reflect that the earliest evidence for tool use and meat eating is now much earlier than previously thought, but it is also the first time that these behaviors have been attributed to *A. afarensis*, said Alemseged, who is curator of anthropology at the California Academy of Sciences in San Francisco and head of the Dikika Research Project, which made the discovery.

Previously, experts had thought that "these key human attributes [were] unique to the genus *Homo*," he added.

The bones were found about 200 meters away from the bones of Selam, known as "Lucy's Daughter" or, as Alemseged described her, "the earliest child." Selam, who lived about 3.3 million years ago, is the most complete skeleton of a human ancestor and was also unearthed by the Dikika Research Project.

The researchers compared the marks on the fossils to experimentally generated images and also used scanning electron microscopes to examine the marks in detail.

The bones bore two types of distinctive markings, one "the result of carving meat versus pounding the bone to access the bone marrow," Alemseged said.

Both these activities required "considerable forethought going on by our earliest ancestors to be able to understand what they were going to do to devise the type of tool that they would need to do it, and then to do the process," Laitman said. "This is showing us about the level of cognition of thought that was starting to go on with our ancestors some 3.5 million years before the present."

The Dikika research team was not able to determine if *A. afarensis* actually made the tools or if they just took advantage of available rocks.

The findings are also "an important statement on what our earliest ancestors were going for and eating," Laitman said. "Our kind are meat eaters, and have evolved from a long line of meat eaters. We've always had the taste for the equivalent of a fast-food hamburger and this was their way of getting it."

Alemseged, who was in the field and present at the exact moment the bones were upturned described his reaction as one of, "This cannot be true."

"The age of the sediments we were working on was much older than what we knew was the earliest evidence of tool use and meat eating," he explained. "Once the results were confirmed, there was a lot of excitement."

"This is super-exciting. This is really an elegant piece of historical detective work, more riveting than any television CSI [crime scene investigation] story," Laitman added. "They have managed to combine their anatomical, paleontological and archaeological skills with state-of-the-art technology to literally crack into the cracks made in the bones 3.5 million years ago. They don't just have the tools. They have what the tools did, which in many ways is even more exciting."

# MailOnline

## **Scientists stunned as they discover our ancestor 'Lucy' used stone tools to butcher animals 3.4million years ago**

By David Derbyshire

August 11, 2010

Our ancient ancestors were using tools to butcher meat one million years earlier than previously thought, scientists revealed tonight in a discovery that will rewrite the history of mankind.

In an extraordinary find, archaeologists discovered the marks of sharp stone blades on animals bones cast aside 3.4 million years ago.

The tools were used to carve slices of meat off the bones, and smash them open to reach the nutritious marrow inside.

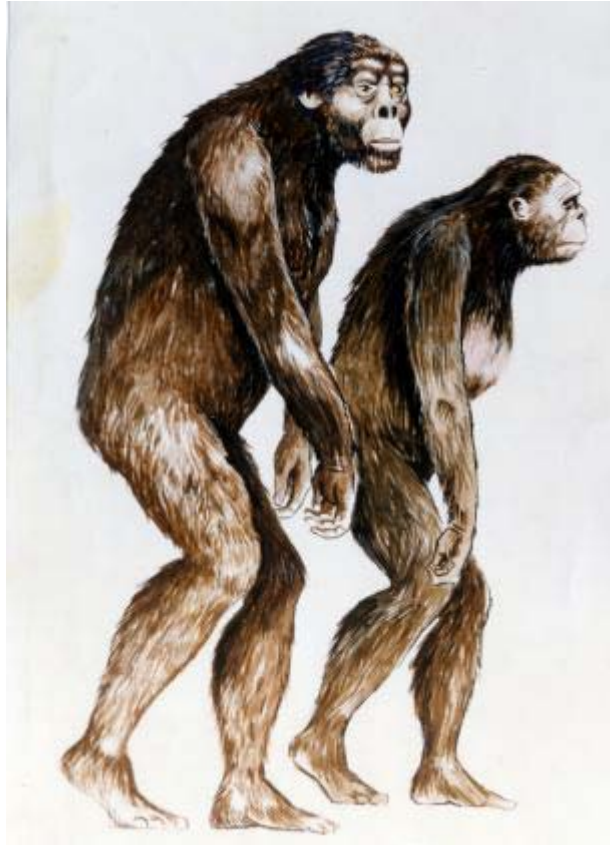
The finding has stunned scientists who say the first use of tools is one of the pivotal moments of humanity's development.



Two parallel cut marks made by stone tools cutting into tissues on the rib of something similar to a cow

Dr Zeresenay Alemseged, from the California Academy of Sciences who found the bones in Africa, said: "The discovery dramatically shifts the known time frame of a game-changing behaviour for our ancestors.

"Tool use fundamentally altered the way our early ancestors interacted with nature, allowing them to eat new types of food and exploit new territories.



'Lucy' a human predecessor that lived more than 3 million years ago

'It also led to tool making - a critical step in our evolutionary path that eventually enabled such advanced technologies as airplanes, MRI machines and iPhones.'

Until now, the oldest known tool was around 2.4 million years old.

The marks were discovered on a fossilised bone unearthed in the Afar region of Ethiopia. The bones were butchered by an squat ape-like ancestor called *Australopithecus afarensis*.

The best known member of the species is 'Lucy' - who was found in Ethiopia's Awash Valley in 1974 and named after the Beatles' song Lucy in the Sky with Diamonds.

Lucy was around 3ft 6inches and walked upright.

He added: 'This find will definitely force us to revise our text books on human evolution, since it pushes the evidence for tool use and meat eating in our family back by nearly a million years.'

'These developments had a huge impact on the story of humanity.'

The latest find was made in Dikika, Ethiopia, 200 yards from the site where Dr Alemseged's team discovered a 3.3 million year old ape relative of Lucy's called Selam in 2000.

Selam was the most complete skeleton of a human ancestor ever found and was nicknamed 'Lucy's daughter'.

'After a decade of studying Selam's remains and searching for additional clues about her life, we can now add a significant new detail to her story,' he said.

'In light of these new findings, it is very likely that Selam carried stone flakes and helped members of her family as they butchered animal remains.'



Two bones that have been damaged by a stone tool that were found in Dikika, Ethiopia. Human ancestors were using stone tools to carve meat from the bone of wild animals nearly a million years earlier than thought



Project leader Zeresenay Alemseged excavating a freshly found 3.4 million year-old Rhino fossil of a species that lived at the same time and place where 'Lucy' butchered carcasses using stone tools

The discovery, reported in the journal Nature, is the first evidence that Lucy and her relatives used tools.

Dr Shannon McPherron, of the Max Planck Institute in Leipzig, Germany said: "Now, when we imagine Lucy walking around the East African landscape looking for food, we can for the first time imagine her with a stone tool in hand and looking for meat.



The skull of Selam - the world's oldest child which was found in Ethiopia

'With stone tools in hand to quickly pull off the flesh and break open bones, animal carcasses would have become a more attractive source of food.

'This type of behaviour sent us down a path that would lead to two of the defining features of our species- carnivory and tool manufacture and use.'

The two butchered bones were sandwiched between two layers of volcanic soil dated to 3.24 and 3.42 million years old. The bones were located much closer to the older sediment.

Dr Jonathan Wynn of the University of South Florida, said: 'We can very securely say that the bones were marked by stone tools between 3.42 and 3.24 million years go, and that within this range the date is most likely 3.4 million years ago.'

One of the two bones was a piece of rib from a mammal the size of a cow. The other was a fragment of leg from a goat-sized mammal.

An analysis of the bones showed the marks were made before they were fossilised. However, it is impossible to tell whether Lucy's relatives were making flint and stone tools - or simply picking up sharp stones from the ground.

Until now, the oldest evidence of tools came from Bouri in Ethiopia where cut-marked bones were dated to around 2.5 million years ago. The oldest known stone tools - dated to the same period - were found close by.

<http://www.dailymail.co.uk/sciencetech/article-1302184/Scientists-discover-ancient-ancestor-Lucy-used-stone-tools-butcher-animals-3-4million-years-ago.html?ito=feeds-newsxml#ixzz0wJonhkYa>

# DISCOVER

Science, Technology, and The Future

## [Lucy's Species May Have Used Stone Tools 3.4 Million Years Ago](#)

August 11, 2010



Was Lucy a tool user and a meat eater?

Quite possibly, argues a new [study](#) in *Nature*. Archaeologist Shannon McPherron turned up animal bones at an Ethiopian site that he says show

markings of stone tool cutting dating back nearly 3.4 million years. That would be a big jump in the record: Right now the oldest known evidence of tool use among our ancestral species dates back about 2.6 million years.

McPherron's date falls in the time of *Australopithecus afarensis*, the species to which the famous Lucy find belongs. But thus far he's found only the markings on bones—not the tools themselves. Perhaps not surprisingly, though, at least one scientist behind the 2.6 million-year-old find says the new study is not convincing evidence that tool use dates back all the way to 3.4 million years ago.

For plenty more about the find—and the differing opinions—check out DISCOVER blogger [Ed Yong's post](#).

## Tool Use by Early Humans Started Much Earlier

***Small-brained human ancestors used stone tools to whack into large mammals some 800,000 years earlier than previously thought.***

By [Jennifer Viegas](#)

August 11, 2010

### THE GIST

- The earliest known evidence for stone tool use and meat eating among early humans is found.
- The evidence -- butchered, fossilized bones -- dates to roughly 3.4 million years ago.
- It's believed the ancestor *Australopithecus afarensis* (to which "Lucy" belongs) used the tools.



These two stone tools made from modified bones were found in Dikika, Ethiopia. The fossils suggest early humans were using tools some 3.4 million years ago.

*Dikika Research Project*

Fossilized bones scarred by hack marks reveal that our human ancestors were using stone tools and eating meat from large mammals nearly a million years earlier than previously thought, according to a new study that pushes back both of these human activities to roughly 3.4 million years ago.

The first known human ancestor tool wielder and meat lover was *Australopithecus afarensis*, according to the study, published in the latest issue of *Nature*. This species, whose most famous representative is the skeleton "Lucy," was slender, toothy and small-brained.

"By pushing the date for tool use and meat eating in our lineage back by around 1 million years, our finds show that tool use and meat eating was not unique to (the genus) *Homo*, a widely accepted notion in our field," co-author Zeresenay Alemseged told Discovery News.

"Also, by showing that *A. afarensis* was involved in these activities, we showed that you do not need a large brain to do this," added Alemseged, director of the Department of Anthropology at the California Academy of Sciences.

"This is a kind of find that will force us to revise our human evolution and anthropology textbooks."

He and his colleagues from the Dikika Research Project made the determinations while working in the Afar Region of Ethiopia. There they unearthed two fossilized bones bearing stone tool marks. One of the bones belonged to a large, buffalo-sized, hooped mammal, while the other was possibly from an Impala, gazelle or antelope.

Various types of electron microscopy, along with chemical analysis, determined that cut marks were inflicted while one or more individuals carved meat off the bones with a sharp stone tool. Percussion marks were also created when a stone tool broke open the bones to extract their nutritious marrow.

The fossilized bones were found sandwiched between volcanic deposits, which permitted reliable dating of them. Before this discovery, the world's oldest human evidence for butchery dated to 2.5 million years ago and came from Bouri and Gona, Ethiopia. No human remains were found in association with those fossilized prey bones, but *A. afarensis* remains were previously unearthed near the recent Afar Region discoveries.

Since the Afar stone tools were transported to the kill or scavenge site from nearly four miles away, *A. afarensis* must have valued the sharp objects. What's unclear, however, is whether or not the ancient hominids made the stones themselves, or just picked already sharp stones up from the ground.

Lead author Shannon McPherron told Discovery News that she and her team plan to next look for "the locations on the landscape where *A. afarensis* (likely) broke one stone with another to create a sharp-edged flake."

"This activity leaves behind debris, unused flakes and perhaps the stone from which the flakes were removed, which we can recognize as evidence of stone tool manufacture," said McPherron, a Paleolithic archaeologist at the Max Planck Institute for Evolutionary Anthropology.

Alemseged added that "meat consumption has definitely contributed greatly to tool technology."

Archaeologist David Braun of the University of Cape Town agrees. In a separate *Nature* commentary, Braun wrote that improved butchery methods "may have set the stage for a greater reliance on animal tissues and more sophisticated stone-tool production."

Since fossils for *A. afarensis* have been found in Kenya and Tanzania, in addition to Ethiopia, Braun is hopeful that future research can determine if this species was "a habitual tool user" or not.

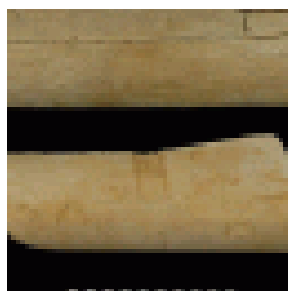
"More surprises surely await us in the fossil-rich sedimentary basins of East Africa," Braun concluded.

# 'Lucy' species used stone tools, fossil study says

By MALCOLM RITTER, AP Science Writer



In a 2009 photo provided by the Dikika Research Project, project leader Dr. Zeresenay Alemseged excavates a freshly found 3.4 million years old Rhino fossil of a species that lived at the same time and place where the *Australopithecus afarensis* butchered carcasses using stone tools.



Two ancient animal bones from Ethiopia show signs of butchering by human ancestors, moving back the earliest evidence for the use of stone tools by about 800,000 years, researchers say.

The bones appear to have been cut and smashed some 3.4 million years ago, the first evidence of stone tool use by [Australopithecus afarensis](#), the species best known for the fossil dubbed "Lucy," says researcher [Zeresenay Alemseged](#).

"We are putting stone tools in their hands," said Alemseged ("Uh-lem-suh-geh") of the California Academy of Sciences, who reports the finding with colleagues in Thursday's issue of the journal Nature.

Some experts urged caution about the study's conclusions.

The study authors said the bones indicate the human ancestor used sharp stones to carve meat from the carcasses of large animals and other stones to smash bones to get at the marrow. One bone is a rib from a creature the size of a cow, and the other a leg bone from something the size of a goat. No stone tools were found at the site.

The researchers also called the finding the earliest evidence for meat-eating among hominins, an evolutionary group that includes people and their ancestors.

The study authors attributed the tool use to afarensis because no other hominin is known from that time in the area where the bones were found. The skeleton of a young afarensis female, dubbed "Selam," had previously been found about 200 yards away from the bone site. The Lucy fossil, which dates to 3.2 million years ago, was discovered in the same general area in 1974.

Alemseged said afarensis probably scavenged carcasses rather than hunting live animals, and ate the meat raw. The researchers said it's not clear whether the stone tools were made or were simply stones that were used as tools. But they plan to look for evidence of tool-making.

Alemseged also said that as some afarensis stripped meat from a carcass, others probably stood guard to ward off predators in return for some of the meat, which would indicate a degree of cooperative behavior.

Until now, the earliest sign of tool use dated to about 2.6 million years ago, also in Ethiopia. It's not clear who used those tools.

Some experts were unconvinced by the Nature paper's arguments.

"I'm very cautious about the conclusions," said Nicholas Toth of [Indiana University](#), a paleoanthropologist who studies early stone tools.

The bones were found on the surface rather than being excavated, he said. That means nobody knows exactly what layers of earth they came from, which is key to knowing their age and associating them with other bones and materials to give them context, he said.

What's more, judging from photos in the Nature paper, the bone markings differ from the marks typically left by stone tools, he said. That raises questions about whether they were actually caused by trampling or animal bites, Toth said.

In fact, those markings look like the work of crocodiles, said Tim White of the [University of California, Berkeley](#). And they don't appear in the places on the bones that one would expect from a butchering, he said.

He also said that 30 years of searching has failed to find any stone tools as old as the bones. "It's not like people haven't been looking. People have been looking intensively," he said.

"An extraordinary claim requires extraordinary evidence," White said. "The evidence is very thin here, and very ambiguous."

But Bernard Wood of [George Washington University](#) declared, "I'd be willing to bet a month's salary that those are cut marks (from stone tools) and not tooth marks."

Wood compared the find to the famous 1978 discovery of tracks in Tanzania that showed upright walking 3.6 million years ago, most likely by afarensis.

The bone markings "are as significant a statement about early hominin behavior as the [Laetoli footprints](#) are about hominin locomotion," Wood said. While it's reasonable to assume that afarensis wielded the tools, he said, Alemseged's ideas about the butchers being guarded by other afarensis in exchange for meat is "pushing the envelope a bit far."

Wood also said the finding suggests afarensis ate meat but doesn't prove it, because maybe they cut off animal flesh just to get to the marrow.



## Butchered Bones Prove Ancient Tool Use

By Stephanie Pappas

August 11, 2010



Dikika Research Project

Scientists noticed two parallel cut marks made by stone tools cutting into tissues on the rib of a cow-sized or larger ungulate, suggesting our human ancestors were ripping meat from the bones.

The timeline of early human evolution needs another revision with the discovery that human ancestors used [tools](#) 800,000 years earlier than previously realized.

The finding in Ethiopia, a pair of mammalian [fossil bones marred by tool marks](#), pushes tool use back into the age of *Australopithecus afarensis*, an early human ancestor that lived in east

The finding in Ethiopia, a pair of mammalian [fossil bones marred by tool marks](#), pushes tool use back into the age of *Australopithecus afarensis*, an early human ancestor that lived in east Africa 3 million to 4 million years ago.

Archaeologists previously believed that early human ancestors, or hominins, started using tools 2.5 million years ago. That's when evidence shows one of the first *Homo* species, *Homo habilis*, began butchering meat with sharpened stones. (Our species, *Homo sapiens*, didn't show up until about 200,000 years ago.) But the new find is approximately 3.39 million years old, older than the famous [Australopithecus fossil "Lucy,"](#) who lived near the find site 3.2 million years ago.

As far as scientists know, no other human ancestors lived in the area at that time, the researchers report today in the journal *Nature*, which means that Lucy and her relatives were likely responsible for slashing and crushing the bones to remove meat and marrow.

"It's never been shown before that Lucy used [stone tools](#), and it's never been shown before that Lucy ate meat," said Shannon McPherron, an archaeologist at the Max Planck Institute for Evolutionary Anthropology, who discovered the new fossils. "We've moved back these critical behaviors."

### **Handy ancestors**

Pinning down the emergence of stone tools and meat-eating is key for understanding our evolutionary [history](#), the researchers said. Until now, the use of tools seemed linked to an increase in brain size in hominins, prompting theories that the extra calories from butchered meat [fed our ancestors' growing brains](#). The realization that both meat-eating and tool use significantly predate the *Homo* genus could force another look at those theories.

"There had long been an association between tool use and our genus," said David Braun, an archaeologist at the University of Cape Town, who was not involved in the research but penned a commentary on the findings in *Nature*. "That doesn't seem to be the case anymore."

McPherron discovered the fossils in January 2009 while [working](#) at a dig site in Dikika, a dry, dusty area in northeastern Ethiopia. Both are bone fragments, one from the right rib of a cow-sized hoofed mammal, and one from the leg of a similar mammal, this one the size of a goat. Immediately, McPherron noticed cut marks and crushed areas on the bones, as if something had sliced and hit them with a stone.

"We immediately knew that this was something important," McPherron told LiveScience.

The research team analyzed the fossils using a scanning electron microscope to get a close look at the bone surface. They also used a technique called energy dispersive X-ray spectrometry to determine the [chemical](#)

characteristics of the [fossil bones](#). They found that the marks were made before fossilization and that they matched the expected patterns for cut marks by a stone tool. One of the marks even had a tiny chip of stone embedded in it, likely all that remains of some ancient Australopithecine toolkit.

The researchers determined the age of the bones based on Dikika's geology. All of the fossils in this area are between two volcanic layers, one known to be 3.24 million years old and one known to be 3.42 million years old. By dating the layers of sediment between the volcanic [deposits](#), the researchers determined that the fossils are probably 3.39 million years old.

### **Tool makers or just tool users?**

The archaeologists haven't found any actual tools, so they can't know whether *Australopithecus* was making stone tools or just picking up conveniently shaped rocks off the ground. But it's likely that the tool use required some planning: Most of the stones found in Dikika from this time period are small pebbles, McPherron said. The nearest contemporary outcrops of large, sharp stones would likely have been several miles away.

"It suggests that early human ancestors were actually transporting rocks around the landscape pretty long distances, which means they could have been actively seeking out this resource," Braun said. "That kind of [transport](#) pattern is something we don't see amongst chimpanzees or other primates [today]."

Because no other evidence of tool use during this era has been found, using stones to butcher meat may have been a rare behavior among *Australopithecus afarensis*, McPherron said. The researchers plan to continue searching for hints of tool use and for evidence that *Australopithecus* made its own tools.

"It potentially opens up a new period in human evolution where our ancestors were experimenting with stone tools, laying the foundation for the development we see at around 2.5 million years ago," he said.

## Bone discovery pushes date for first use of stone tools back 1m years

Butchered bones found near site of 'Lucy', a probable human ancestor, who lived 3.2m years ago

By Ian Sample

August 11, 2010



*Gouge marks in animal bones suggest human ancestors used stones to cut meat 3.4m years ago. Photograph: Dikika Research Project/PA*

The ancestors of early humans used stone tools to butcher animal carcasses nearly 1m years earlier than previously thought.

Archaeologists revised the date after spotting distinctive cut and crush marks made by stone tools on animal bones dating to 3.4m years ago.

The remains, including a rib from a cow-like creature and a thigh bone from an animal the size of a goat, were recovered from riverbed sediments in Dikika in the Afar region of northern [Ethiopia](#) during an expedition last January.

The marks show where stone tools were used to slice and scrape meat from the carcasses and where the bones were crushed to expose the nutritious marrow inside.

The discovery suggests meat was on the menu far back in our evolutionary history, and long before the arrival of the first human species, *Homo habilis*, 2.3m years ago.

"We were just walking along when we discovered the two bones," said Shannon McPherron, an archaeologist at the [Max Planck Institute for Evolutionary Anthropology](#) in Leipzig. "We picked up the rib fragment, flipped it over and there were these two, clear marks. Soon after, we found the second bone, also with a lot of marks on it. Right away we knew we had something potentially important."

Until now, the oldest evidence of stone-tool use was a haul of more than [2,600 stone flakes estimated to be 2.5m years old](#) that was discovered in another part of Ethiopia in 1997. These tools had been shaped to make sharp cutting edges, but in Dikika, the stones were most likely used as they were found.

The butchered bones were discovered close to where the skeleton of a probable human ancestor, nicknamed [Lucy](#), was found. Lucy belonged to a species called *Australopithecus afarensis* and lived in the region around 3.2m years ago. At the time, the region was warm and wet, with patches of grassland and heavily forested areas populated with early forms of giraffes, monkeys, elephants and rhinos.

"Now, when we imagine Lucy walking around the east African landscape looking for food, we can for the first time imagine her with a stone tool in hand looking for meat," said McPherron. The skeleton of another female, "[Selam](#)", was found 200 miles away.

Detailed analysis of the cut marks on the bones show they differ substantially from tooth and claw marks that can be left by predators. One of the marks was embedded with a small fragment of stone, according to [a report in the journal, Nature](#).

The use of simple stone tools to remove meat and marrow marks a crucial moment in the human story. As the ancestors of early humans turned to meat for sustenance, they were able to grow larger brains which in turn enabled them to make more sophisticated tools.

"These bones may take us to the very beginning of that process," said Chris Stringer, head of human origins at the [Natural History Museum](#) in London.

"What we need from these sites now are evidence of the stone tools themselves, so we can see if they were manufactured or were natural stones that happened to be used for butchery," he added.

Lucy and others of her species probably carried natural stone tools around with them to use when they encountered a dead animal. "It's not a trivial thing to leave the trees behind, wander out onto this open landscape and start removing flesh and marrow from a carcass. Those same carcasses were attracting carnivores that look at these early hominins as a meal, so they were taking a major risk," said McPherron.

## Oldest Evidence for Stone Tools and Eating Meat Discovered in Ethiopia

Wednesday, August 11, 2010



*The two bone fragments discovered at Dikika, Ethiopia are evidence of 'stone-tool-assisted consumption of animal tissues' about 3.40 million years ago. - Image copyright the Dikiki Research Project*

Thinking of Lucy strolling around the east African landscape in search of food, we can now picture her looking for meat – with a stone tool in hand.

Bones found in Ethiopia, push back the earliest known stone tool use and meat consumption by almost one million years and provide the first evidence that these behaviours can be attributed to Lucy's species.

An international team of researchers has discovered evidence our ancestors were using stone tools and ate the nutritious meat and marrow of large mammals 1 million years earlier than previously documented.

While working in the Afar region of Ethiopia, the Dikika Research Project (DRP) found bones bearing evidence of stone tool use; cut marks made while carving meat off the bone and percussion marks created while breaking the bones open to extract marrow.

The bone fragments - dated to roughly 3.4 million years ago - also provide the first record of stone tool use and meat consumption by the *Australopithecus afarensis*. Until now only traces of stone tool use by members of the genus *Homo* were found.

“This discovery dramatically shifts the known timeframe of a game-changing behaviour for our ancestors,” says paleoanthropologist Dr Zeresenay Alemseged. “Tool use fundamentally altered the way our earliest ancestors interacted with nature, allowing them to eat new types of food and exploit new territories. It also led to tool making - the precursor to such advanced technologies as aeroplanes, MRI machines, and iPhones.”

With stone tools in hand to quickly pull off flesh and break open bones; animal carcasses would have become a more attractive source for food. This type of behaviour sent us down a path that later would lead to two of the defining features of our species - carnivory and tool manufacture and use.

Although the butchered bones may not look like particularly noteworthy fossils to the lay person, Alemseged can hardly contain his excitement when he describes them. "This find will definitely force us to revise our text books on human evolution, since it pushes the evidence for tool use and meat eating in our family back by nearly a million years," he explains. "These developments had a huge impact on the story of humanity."

The team's research, [reported in the August 12th issue of Nature](#), shows that the marks were created before the bones fossilized. This means recent damage can be eliminated as cause of the cut-marks.

One cut mark even contained a tiny, embedded piece of rock left behind during the meat cleaving.

"Most of the marks have features that indicate without doubt that they were inflicted by stone tools," explains Dr. Curtis Marean from the Arizona State University, who performed the mark identifications. "And the range of actions includes cutting and scraping for the removal of flesh, and percussion on the femur for breaking it to access marrow."

### **Cutting-edge technology**

Until now, the oldest known evidence of butchering animals with stone tools came from Bouri, Ethiopia, where several cut-marked bones date to about 2.5 million years ago. The oldest known stone tools, dated to between 2.6 and 2.5 million years ago, were discovered at Gona, Ethiopia and most scientists believe the stone instruments were made and used only by early members of the genus *Homo*.

The new cut-marked fossil animal bones from Dikika have been dated to approximately 3.4 million years ago. They were found a few hundred meters away from where Alemseged's team previously discovered 'Selam', a young *A. afarensis* girl who lived about 3.3 million years ago.



*Two parallel cut marks made by stone tools cutting into tissues on the rib of a cow-sized or larger hoofed animal. - Image copyright the Dikika Research Project*



*A cut mark made by a stone tool cutting into flesh on the upper leg bone (femur) of goat-sized young bovid. - Image copyright the Dikika Research Project*

The location and age of the bone fragments clearly indicate that members of the *Australopithecus afarensis* species made the cut marks.

“The only hominin species we have in this part of Africa at this time period is *A. afarensis*, and so we think this species inflicted these cut marks on the bones we discovered,” notes Alemseged.

### **Dating the bones**

To determine the age of the bones, project geologist Dr. Jonathan Wynn relied on a very well documented and dated set of tuffs (volcanic deposits).

These same tuffs were previously used to determine Selam's age and are known from nearby Hadar, where Lucy was found.

The new find site is located in a drainage that contains only deposits older than a tuff securely dated to 3.24 million years ago. Below the find site is a tuff dated to 3.42 million years ago.

Because the cut-marked bones are much closer to the lower tuff, the bones' age is most likely 3.4 million years old.

### **Large beasts on the menu**

Both of the bones came from large mammals.

"The bones come from 2 animals, one (a femur) the size of a goat and the other (a rib) at least the size of a cow," notes Marean. "Our closest living relatives, the chimps and bonobos, don't hunt or scavenge animals this size, so this suggests that the Dikika australopithecines had already begun to engage in hunting or scavenging larger mammals."

This placed them in risky competition with other carnivores, which would likely have required them to engage in an unprecedented level of teamwork.



*The two bone fragments were discovered in the Andedo drainage part of the Dikika project area, Ethiopia. - Image copyright Dikika Research Project*

## **A stone tool industry at Dikika?**

While it is clear that the australopithecines at Dikika were using sharp-edged stones to carve meat from bones, it is impossible to tell from the marks alone whether they were making their tools or simply finding and using naturally sharp rocks.

So far, the research team has not found evidence of stone tool manufacture at Dikika from this early time period.

It is possible the Dikika residents were simply opportunistic about finding and using naturally occurring sharp-edged stones. However, there is another potential explanation.

"For the most part, the only stones we see coming from these ancient sediments at Dikika are pebbles too small for making tools," says Dr. Shannon McPherron, archaeologist with the DRP and research scientist at [the Max Planck Institute for Evolutionary Anthropology](#) in Leipzig. "The hominins at this site probably carried their stone tools with them from better raw material sources elsewhere."

The team plans to return to Dikika and see if they can find these locations and evidence that at this early date hominins were actually making, not just using, stone tools.

While many questions remain about the history of tool use and tool making and about the timing and motivation of dietary changes among human ancestors, this discovery adds a rich new chapter to the story.

"Now, when we imagine Lucy walking around the east African landscape looking for food, we can for the first time imagine her with a stone tool in hand and looking for meat," says Dr. McPherron.

"With stone tools in hand to quickly pull off flesh and break open bones; animal carcasses would have become a more attractive source for food. This [type of behaviour](#) sent us down a path that later would lead to two of the defining features of our species - carnivory and tool manufacture and use."

## **`Lucy' species used stone tools, fossil study says**

August 11, 2010

Stumbleupon: `Lucy' species used stone tools, fossil study says digg: US Works With Sudan Government Suspected Of Aiding Genocide reddit: `Lucy' species used stone tools, fossil study says del.icio.us: `Lucy' species used stone tools, fossil study says

NEW YORK — Two ancient animal bones from Ethiopia show signs of butchering by human ancestors, moving back the earliest evidence for the use of stone tools by about 800,000 years, researchers say.

The bones appear to have been cut and smashed some 3.4 million years ago, the first evidence of stone tool use by *Australopithecus afarensis*, the species best known for the fossil dubbed "Lucy," says researcher Zeresenay Alemseged.

"We are putting stone tools in their hands," said Alemseged ("Uh-lems-uh-ged") of the California Academy of Sciences, who reports the finding with colleagues in Thursday's issue of the journal *Nature*.

Some experts urged caution about the study's conclusions.

The study authors said the bones indicate the human ancestor used sharp stones to carve meat from the carcasses of large animals and other stones to smash bones to get at the marrow. One bone is a rib from a creature the size of a cow, and the other a leg bone from something the size of a goat. No stone tools were found at the site.

The researchers also called the finding the earliest evidence for meat-eating among hominins, an evolutionary group that includes people and their ancestors.

The study authors attributed the tool use to *afarensis* because no other hominin is known from that time in the area where the bones were found. The skeleton of a young *afarensis* female, dubbed "Selam," had previously been found about 200 yards away from the bone site. The Lucy fossil, which dates to 3.2 million years ago, was discovered in the same general area in 1974.

Alemseged said *afarensis* probably scavenged carcasses rather than hunting live animals, and ate the meat raw. The researchers said it's not clear whether the stone tools were made or were simply stones that were used as tools. But they plan to look for evidence of tool-making.

Alemseged also said that as some afarensis stripped meat from a carcass, others probably stood guard to ward off other animals in return for some of the meat, which would indicate a degree of cooperative behavior.

Until now, the earliest sign of tool use dated to about 2.6 million years ago, also in Ethiopia. It's not clear who used those tools.

Some experts were unconvinced by the Nature paper's arguments.

"I'm very cautious about the conclusions," said Nicholas Toth of Indiana University, a paleoanthropologist who studies early stone tools.

The bones were found on the surface rather than being excavated, he said. That means nobody knows exactly what layers of earth they came from, which is key to knowing their age and associating them with other bones and materials to give them context, he said.

What's more, judging from photos in the Nature paper, the bone markings differ from the marks typically left by stone tools, he said. That raises questions about whether they were actually caused by trampling or animal bites, Toth said.

In fact, those markings look like the work of crocodiles, said Tim White of the University of California, Berkeley. And they don't appear in the places on the bones that one would expect from a butchering, he said.

He also said that 30 years of searching has failed to find any stone tools as old as the bones. "It's not like people haven't been looking. People have been looking intensively," he said.

"An extraordinary claim requires extraordinary evidence," White said. "The evidence is very thin here, and very ambiguous."

But Bernard Wood of George Washington University declared, "I'd be willing to bet a month's salary that those are cut marks (from stone tools) and not tooth marks."

Wood compared the find to the famous 1978 discovery of tracks in Tanzania that showed upright walking 3.6 million years ago, most likely by afarensis.

The bone markings "are as significant a statement about early hominin behavior as the Laetoli footprints are about hominin locomotion," Wood said. While it's reasonable to assume that afarensis wielded the tools, he said, Alemseged's ideas about the butchers being guarded by other afarensis in exchange for meat is "pushing the envelope a bit far."

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<http://www.huffingtonpost.com/huff-wires/20100811/us-sci-earliest-tools/>

Inside  
thestar.com

## Stone tools a million years older than thought

Wednesday, August 11, 2010



Distinctive markings believed to be made by stone tools can be seen on these fossilized antelope bones.

Dikika Research Project, California Academy of Sciences

They're just a few distinctive markings on some fossilized antelope bones.

But they add an astonishing million years to the origins of our humanity.

A new study of bones found in Ethiopia shows that a pre-human species known as *Australopithecus afarensis* — the famous Lucy’s people — were using tools and eating meat a thousand millennia before it was thought any of our ancestors had.

“This discovery dramatically shifts the known timeframe of a game-changing behaviour for our ancestors,” says, Zeresenay Alemseged, an anthropologist with the California Academy of Sciences.

The study, which Alemseged co-authored, was published Wednesday in the journal *Nature*.

It shows, he says, that activities thought to be unique to Homo species — of which we Homo sapiens are the latest incarnation — actually existed in far more distant ancestors.

It also means that the social and physiological traits associated with tool use and meat-eating were evolving long before human-like species showed up and that these traits were part of the evolutionary gifts bequeathed to us by earlier creatures.

Alemseged’s team found two bones, a rib and a thigh — one with unambiguous cut marks along its surface, the other showing certain signs it had been pounded with stone to get at its marrow.

“This shows that over 3.4 million years ago our ancestors were using tools and consuming animal meat,” Alemseged said in an interview from Addis Ababa.

“Currently the evidence we have for these two key events in human evolution are around 2.5 million years ago.”

This early tool use and meat eating are game changers that will force scientists to rethink the progression of our social and physiological evolution through to our current Homo sapiens status, Alemseged says.

For example, meat-eating would fundamentally alter the way our ancestors interacted with one another, forcing them to create social strategies to ward off predators trying to get at their food.

While *Australopithecus afarensis* walked upright, they were likely too slow and cumbersome to be hunters, Alemseged says.

Thus the meat that they did consume, which the stone tools gave them their first access to, was probably cut from found carcasses that other scavengers would be keen to have.

“There were other groups on the landscape who were interested in (the meat), hyenas and other scavengers,” Alemseged says.

“So to do that you have to have a network whereby some would be carving the meat and some would be driving the hyenas off.”

This rudimentary networking would be the precursor to all the socialization and specialization that were thought to be unique to Homo species like our own, Alemseged says.

Meat also packs far more calories than the leaves and fruits that would be the most abundant food available before stone tool usage, he says.

Indeed, he says, it would likely have taken a day of foraging to gather enough leaves and berries to match the caloric intake of one helping of antelope.

“So it gives you more time to interact and socialize as opposed to foraging for food the whole day,” Almeseged says.

“I wouldn’t be surprised if it was this meat consumption that eventually led to the expansion of the brain.”

This leisure time and social interaction that meat-eating provided meant that the Homo genus creatures, like humans, had a huge head start in their evolution that researchers had never suspected, Almeseged says.

“What we are finding is the meat-eating and tool use wasn’t a sudden event that happened with the emergence of Homos,” he says.



A KQED Multimedia Series Exploring Northern California Science, Environment and Nature.

## Have Tool, Will Evolve

By Sheraz Sadiq

August 11th, 2010



*Artist's rendering of A. afarensis using stone tools. By Viktor Deak, copyright California Academy of Sciences*

*Originally reported for [KQEDnews.org](http://KQEDnews.org).*

The next time you reach for your high-carbon, stainless steel chef's knife to trim the excess fat off a bone-in Porterhouse steak, you may want to raise a glass to your ancestors who roamed Africa millions of years ago.

A Bay Area researcher and his team made a startling discovery when they unearthed a pair of bones recently in northeastern Ethiopia: the earliest evidence of stone tool use by upright human ancestors 3.4 million years ago – nearly a million years earlier than scientists previously had believed.

“The moment that sort of primitive species, not so primitive anymore, started to use those tools, it started to open up the type of species we are today,” said Zeresenay Alemseged, chair of the anthropology department at the [California Academy of Sciences](http://CaliforniaAcademyofSciences.org) in San Francisco.

“That primitive stone tool they made 3.4 million years ago is the precursor for all the technologies that we have today.”

Alemseged's research appears in Thursday's edition of the journal [Nature](http://Nature.org).



*Zeresenay Alemseged in his office at the California Academy of Sciences. Photo by Sheraz Sadiq*

### **Meat at the ancient watering hole**

The discovery could help rewrite understanding how humans evolved, because stone tool use and meat eating were key steps taken along the evolutionary path leading to the big-brained species we are today.

“Brain tissue is extremely expensive to grow and maintain, so meat provided a dense source of calories, and additional nutrients like fats and proteins that are important for growing big brains”, said Teresa Steele, a professor of anthropology at the University of California-Davis.

The species at the center of the research bore only a passing resemblance to today's *Homo sapiens*. Known as [\*Australopithecus afarensis\*](#), the human forebears were long-limbed, about four feet tall, resembling chimpanzees that walked upright but also partially lived in trees. They were thought to have eaten mostly leaves and fruits. But now scientists have a more accurate picture of their diet and behavior.

“This new discovery clearly shows that the picture we had was wrong, because the species was not only using tools, but was using tools to interact with large mammals, to exploit meat from very large mammals and no other non-human species can do that,” said Alemseged.

They weren't so much hunting their meals as scavenging them, he said, because their legs weren't built for chasing prey. Alemseged believes they would venture into the open grasslands of East Africa to find dying or recently deceased animals, like antelope, and use their tools to obtain the nutrient-rich meat. Then, they would need to work as a team in a landscape teeming with other hostile, hungry predators.

“When some were using tools to carve the meat off the bone or break the bones to access the marrow, some maybe were watching for hyenas or lions. And that's why I can confidently say that when we revise the textbooks for the earliest evidence for stone tool use and meat eating, we will have to revise also the picture of the species *Australopithecus afarensis* on the ancient landscape,” he added.

The behavior suggests a certain level of intelligence and planning, which is impressive considering that “Lucy,” a partial skeleton of *Australopithecus afarensis* unearthed 36 years ago, had a brain that was roughly a third the size of a human brain, which first started cogitating in modern human form about 200,000 years ago.

Humans and chimps share a common evolutionary ancestor, and chimps also use tools, such as twigs to dig for termites in mounds or rocks to break open nuts. Humans, however, are the only primate species to intentionally make sharp-edged tools to hunt or scavenge prey much larger than themselves.



*Fossilized bone fragments from Dikika, Ethiopia that show evidence of stone tool use. Copyright California Academy of Sciences.*

### **Leaving no fossil unturned**

Alemseged’s latest discovery grew out of the [Dikika Research Project](#), which he has led since 1999, looking annually for fossils in the Afar region of Ethiopia -- a dry land once dotted with forests and grassy savannahs on which [the earliest upright human ancestor](#) would have taken its first two-legged steps six million years ago. In early 2009, just six miles from where Lucy was found, this “cradle of mankind” as Alemseged calls it, offered up the tantalizing find announced this week.

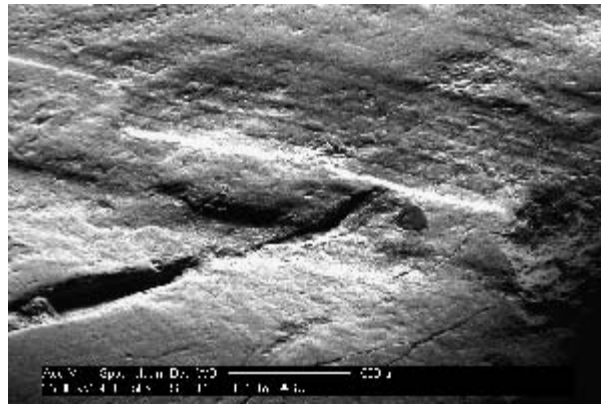
“We took everything back to the camp and a group of us was sitting in the camp and just everyday going through each bone. And then our paleontologist noticed something on the foot bone of an antelope, and when we looked at it, there were cut marks evidently,” Alemseged said.

Although that bone didn’t turn out to have the cut marks that were indicative of stone tool use, two bone fragments did – one from the rib bone of a cow-like animal and one from the leg of a goat-sized antelope. But the team had to be sure, because the marks could have been caused by abrasion over the years or by the teeth of another predator. So Alemseged received permission from the government of Ethiopia to send the bones out of the country to Arizona State University, where they were examined by high-tech forensic tools.

An environmental scanning electron microscope enlarged the cut marks to reveal a pattern consistent with a scraping and pounding motion from a sharp-edged stone tool. Within one of the cut marks on one of the bones was further irresistible proof of early human activity.

“We discovered a rock that has a completely different chemical composition from the bone itself. So that means that it came into the cut mark when someone was using a sharp-edged igneous rock to cut the bone or the meat. Based on chemical analysis we were able to show that that cut mark was made by stone and done before the fossil fossilized,” Alemseged said.

Since massive volcanic eruptions 3.42 and 3.24 million years ago spewed layers of volcanic ash into the basin where the cut-marked bones were found, dating the bones was relatively straightforward. The research team settled on a date of 3.4 million years because the bones were found in a sediment layer close to the layer containing the volcanic ash from 3.42 million years ago.



*Under a microscope, one of the bone fragments reveals evidence of a scraping motion. Photo courtesy of Hamdallah Bearat, Arizona State University*

### **Where are the tools?**

Alemseged, a 41 year-old, Ethiopian-born paleoanthropologist, had already made a name for himself with his discovery in 2000 of “[Selam](#),” the oldest and most complete remains of an *Australopithecus afarensis* child who lived more than three million years ago.

As he once more enters the world of this ancient human ancestor, a key mystery remains.

“The most obvious question is, ‘where are the tools?’”, said David Braun, a senior lecturer at the University of Cape Town in South Africa who studies fossils bearing marks of early stone tool use. “These early tools will actually represent the dawn of human culture and will likely be difficult to identify”, said Braun.

The oldest found stone tools – made of basalt, quartz and flint - were also discovered in Ethiopia, dating back some two and a half million years ago. If they still exist, it will be a challenge to find stones with sharp, flaked edges that could have been used to butcher meat more than three million years ago, now dispersed and lying hidden for millennia under layers of soil. And while

these ancient human ancestors now appear to have been using tools, whether they actually made them is likely to be a subject for debate. “There is currently no evidence that they actively chipped stone to make tools. The earliest tools are most likely sharp-edged stones that were opportunistically used”, said Braun.

When they’re in the field, Alemseged and his team of scientists and graduate students works up to 12 hours a day, seven days a week for a month or more, combing an area not just for large, readily identifiable bones, but also for fragments which require further scrutiny.

“The fact that we made this discovery is because we changed the way we were collecting the fossils, so we need to continue to look for more cut-marked bones and really show that it is a standard thing to do and then find the stone tools that were used to inflict those marks on the bones,” he said.

“We’re trying to address one of the most important questions in humanity: who we are and where do we come from. This individual who carved that stone tool contributed to your genes, my genes, to every person’s genes on this planet.”

## Discovery Moves Use of Stone Tools Back 800,000 Years

***Team found evidence of two animal bones that had been marked by eating tools***

Wednesday, August 11, 2010

By Amanda GardnerHealthDay Reporter



Parallel cut marks on rib of cow-sized animal  
Photo: Dikika Research Project

(HealthDay News) -- Scientists excavating in Ethiopia have come across bones from a cow-sized animal and an antelope, probably eaten by early human ancestors, that seem to have been dug out by tools -- probably to get the nutritious marrow out.

The bones are dated to about the time of *Australopithecus afarensis*, or the famous "Lucy" and her kin, which effectively moves back the date of the first known use of stone tools by hominins by almost a million years, from about 2.6 or 2.5 million years ago to 3.4 million years ago.

"The most obvious [value of the discovery] is that it pushes our knowledge of stone-tool use in the hominid lineage 800,000 years earlier than anything we previously knew," said Jeffrey T. Laitman, distinguished professor and director of anatomy and functional morphology and of gross anatomy at Mount Sinai School of Medicine in New York City. "This is a quantum leap in our knowledge."

The discovery changes the known evolutionary history of humans, said Zeresenay Alemseged, co-author of a paper on the discovery published in the Aug. 12 issue of *Nature*.

Not only must the record be changed to reflect that the earliest evidence for tool use and meat eating is now much earlier than previously thought, but it is also the first time that these behaviors have been attributed to *A. afarensis*, said Alemseged, who is curator of anthropology at the California Academy of Sciences in San Francisco and head of the Dikika Research Project, which made the discovery.

Previously, experts had thought that "these key human attributes [were] unique to the genus *Homo*," he added.

The bones were found about 200 meters away from the bones of Selam, known as "Lucy's Daughter" or, as Alemseged described her, "the earliest child." Selam, who lived about 3.3 million years ago, is the most complete skeleton of a human ancestor and was also unearthed by the Dikika Research Project.

The researchers compared the marks on the fossils to experimentally generated images and also used scanning electron microscopes to examine the marks in detail.

The bones bore two types of distinctive markings, one "the result of carving meat versus pounding the bone to access the bone marrow," Alemseged said.

Both these activities required "considerable forethought going on by our earliest ancestors to be able to understand what they were going to do to devise the type of tool that they would need to do it, and then to do the process," Laitman said. "This is showing us about the level of cognition of thought that was starting to go on with our ancestors some 3.5 million years before the present."

The Dikika research team was not able to determine if *A. afarensis* actually made the tools or if they just took advantage of available rocks.

The findings are also "an important statement on what our earliest ancestors were going for and eating," Laitman said. "Our kind are meat eaters, and have evolved from a long line of meat eaters. We've always had the taste for the equivalent of a fast-food hamburger and this was their way of getting it."

Alemseged, who was in the field and present at the exact moment the bones were upturned described his reaction as one of, "This cannot be true."

"The age of the sediments we were working on was much older than what we knew was the earliest evidence of tool use and meat eating," he explained. "Once the results were confirmed, there was a lot of excitement."

"This is super-exciting. This is really an elegant piece of historical detective work, more riveting than any television CSI [crime scene investigation] story," Laitman added. "They have managed to combine their anatomical, paleontological and archaeological skills with state-of-the-art technology to literally crack into the cracks made in the bones 3.5 million years ago. They don't just have the tools. They have what the tools did, which in many ways is even more exciting."



## Lucy the Butcher? Tool Use Pushed Back 800,000 Years

*Human ancestors sliced meat much earlier than thought, bones suggest.*

August 11, 2010



*Cut marks on a hoofed animal's rib may be evidence of the earliest known human-ancestral tool use.  
Photograph courtesy Dikika Research Project via Science*



A reconstruction of the "Lucy" *Australopithecus afarensis* fossil at Chicago's Field Museum. Photograph by Tim Boyle, Getty Images.

**Early human ancestors may have been using tools about 800,000 years earlier than thought, according to a new study based on newfound bone evidence—prehistoric leftovers linked to the famed "[Lucy](#)" fossil's species.**

**The discovery suggests, to at least one scientist, that tool use may extend as far back as five million years ago, to the last common ancestor of chimps and humans.**

Found in East Africa, the two 3.4 million-year-old animal bones behind the new study appear to have been cut and crushed by stone tools wielded by the apelike human-ancestor species *Australopithecus afarensis*.

"You have all these images in museums and elsewhere showing Lucy walking through this East African landscape looking for food, and now we can put a stone tool in Lucy's hand," said study co-author [John A. Hawks](#), an archaeologist with the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany.

The finding, to be published tomorrow in the journal *Science*, could force a scientific rethink of how the brain sizes of our early ancestors were affected by meaty diets.

### **A. *Afarensis* Likely Candidate**

Excavated from a dusty ridge in the Afar Basin, the two butchered bones include a rib (pictured above) from an unidentified cow-size animal and a thighbone from a goat-size antelope. Cut marks suggest that stone tools were used to remove the flesh from the bones and to extract marrow.

It's unlikely that the marks were been made by any other hominids, or hominins—members of our ancestral lineage and close evolutionary relatives—except *A. afarensis*.

"In this part of the world, at this time period, the only [hominid] species found to this point has been *afarensis*," McPherron said.

*A. afarensis* probably did not use their tools for hunting, he added. More likely, the early human ancestors were scavengers who used stones to butcher animal carcasses they came across.

### **Previous "Earliest" Human Tools**

Prior to the new discovery, the earliest direct proof of stone-tool creation and use among hominins dated to about 2.5 million years ago.

This younger evidence consists of marked bones and stone tools, which many paleoanthropologists think were left behind by *Homo habilis*, or "handy man," one of the earliest species of the human genus, *Homo*.

According to some scientists, the likely *H. habilis* tools are too well made to have been our evolutionary ancestors' first attempts at making tools.

"Scientists have been able to show that hominins [living around 2.5 to 2.6 million years ago] weren't just randomly going up to a cobble bed and selecting any kind of rock. ...," said [redacted], a Paleolithic archaeologist at the University of Cape Town in South Africa.

"They were selecting certain types of rocks that were particularly good for making stone tools," said Braun, who was not involved in the new tool study but who wrote an accompanying commentary for *Nature*.

Because of the relative sophistication of the previous "oldest tools" record holders, he said, "many scientists have suggested there must be something older."

Now, apparently, there is.

But while the new findings suggest *A. afarensis* was using stone tools, there's no evidence the species was making them. It's possible that, like modern chimpanzees, Lucy and her ilk were using unaltered rocks.

Maybe, though, proof of *A. afarensis* toolmaking just hasn't been found yet. "My gut feeling says that we're going to find evidence of [tool] manufacture as well," study co-author McPherron said.

### **Brain-Tool Feedback Loop for Early Human Ancestors?**

The new tool findings could challenge theories about the effects of meat consumption on hominin brain size.

Some scientists have speculated that meat eating, stone-tool manufacture, and large hominin brains are related in a kind of feedback cycle.

The idea is that the "increased nutrients of meat allow you to grow a larger brain, which allows you to come up with novel solutions to make better stone tools, which allow you to get more meat," McPherron said.

"But here we're looking at meat consumption long before we're seeing increases in brain size."

### **Tools Date Back to Dawn of Human Evolution?**

The new tool findings are "a very important scientific discovery," said paleoanthropologist [redacted], who also was not involved in the study.

In addition to pushing back the advent of hominin tool use by almost one million years, the study opens up the possibility that human-ancestral tool use is even older—perhaps dating all the way back to when the ancestors of humans and chimpanzees split about five million years ago, said

Shea, of Stony Brook University in New York State. (Related: ["'Key' Human Ancestor Found: Fossils Link Apes, First Humans?'"](#))

"Humans and chimpanzees both habitually use tools, so it stands to reason that the last common ancestor was a tool user as well," he added.

### **Tool Use Passed Down Along Evolutionary Lines?**

Another possibility raised by the new discovery is that tool use was a learned behavior, passed down among hominins, across different species and even genera—for example, from *Australopithecus* to *Homo*.

"We'll have to find more than these two bones, but if we fill in the record and we find more evidence of this, then we might be looking at a kind of learned behavior that was then shared and passed along in and amongst these groups," study co-author McPherron said.

An alternative explanation, Stony Brook's Shea said, is that different hominin groups discovered stone-tool use, and later stone-tool manufacture, independently.

"It's not that complex a behavior," Shea said. Tool use probably arose "again and again until it was locked in as a stable component amongst later hominins."

## Butchering dinner 3.4 million years ago

**Slashed animal bones suggest early hominins were chopping up predator kills earlier than we thought.**

By Richard Lovett

August 11, 2010



*Stone tools probably made the parallel marks on the upper animal bone from the Ethiopian dig. Dikika Research Project*

Early hominins were using stone tools to butcher meat as long ago as 3.4 million years, about 800,000 years earlier than previous evidence dates to, scientists report in this week's issue of *Nature*.<sup>1</sup>

The finding comes from an examination of animal bones found last year in the Lower Awash Valley of Ethiopia. This site is not far from the spot where the same research team, led by palaeoanthropologist Zeresenay Alemseged of the California Academy of Science, San Francisco, had previously discovered a 3.3-million-year-old juvenile *Australopithecus afarensis* fossil dubbed 'Lucy's Baby'. That find is one of the most complete skeletons of an ancient human ancestor to be discovered so far.<sup>2</sup>

The animal bones — one from an impala-sized creature, the other from one closer in size to a buffalo — bear cut marks that indicate butchering, says their finder, Shannon McPherron, an archaeologist at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and a member of Alemseged's team.

This, he says, means that early hominins — presumably *Australopithecus afarensis* — were not only using tools, but also venturing out of the safety of the forests and onto the plains in search of meat.

However, they probably weren't hunting, McPherron says; it is more likely that they were scavenging predator kills. Still, the search for large-animal meat is an important step in human development. "We've put this important, fundamental behaviour back into Lucy's time," says McPherron, who is lead author of the new study.

The same is true for tool usage. Previously, the earliest known date for tool usage was about 2.5 million years ago — right about the time that humanity's own genus, *Homo*, was first emerging. Now, it seems that tool usage pre-dates our genus. "We're pushing much deeper into our evolutionary past," McPherron says.

### ***Different for chimps***

It's an important find, says David Braun, a Palaeolithic archaeologist at the University of Cape Town in South Africa, because our closest living relatives don't engage in such behaviours. "Chimpanzees do not recognize large animals or carcasses killed by other animals as food," he says. "At some point, hominins did."

Proving the discovery was a two-step process, involving both dating the bones and verifying that the marks on them were inflicted by stone tools rather than by trampling, teeth or post-fossilization damage.

To do that, the team examined the bones both chemically and under a microscope. The chemical tests confirmed that the damage had occurred before the bones were fossilized; the microscopic examination confirmed that it was the result of cutting.

"The results are very clear," McPherron says.

Some of the cuts are V-shaped in cross section, for instance — a shape characteristic of those made by sharp tools — with scratches inside the cuts left by the tool's rough edge. Other marks showed signs of scraping, and still others indicated that the bones had been bashed with blunt rocks — perhaps in an effort to reach the marrow.

Paul Renne directs the Berkeley Geochronology Center in California, and has worked on studies of some of the oldest known cut-marked bones found previously. "It sure looks convincing to me," he says of the new find.

As for dating, McPherron says the scientists were lucky, because the fossils came from a gully cutting through strata that had been well studied in conjunction with other finds, such as Lucy's Baby, which was discovered only a few hundred metres away. In particular, radioisotope studies had dated two important strata, one at the highest levels in the gully and the other near the bottom. On the basis of these, the scientists knew that the bones could be no more than 3.42 million and no less than 3.24 million years old.



*Project leader Zeresenay Alemseged with the fossil of a rhino living at the same time as the early tool-wielding hominins. Dikika Research Project*

The pattern of magnetic field reversals — which occur at intervals in Earth's history — in the intervening sediments, and estimates of sedimentation rates, further refined the estimate. "The best estimate is 3.39 million years," McPherron says.

Renne concurs. "I think they have a really good case for 3.2 to 3.4 million years ago," he says. Within that range, he adds, the precise date isn't critical. "The fact that they're older than 3 million is pretty exciting."

### ***Convenient rocks***

However, the discovery doesn't mean that early hominins made tools. They may simply have used convenient rocks for tasks such as butchering. But their efforts still required planning because the nearest source of suitable rocks was about 6 kilometres away from where the bones were found.

Renne and Braun are pleased but not startled. "We were hoping there would be older stuff [than my own findings]," Renne says.

Braun adds that the earliest known tools, dating to about 2.5 million years ago, are very well made, which has prompted scientists to wonder whether our ancestors had somehow

"I think many palaeoanthropologists will start looking in this window between 3.2 and 2.5 million years ago for what may be the origins of stone tool production," he says.

McPherron suggests that the best way to do this might be to go to outcrops that could once have been quarry sites. "If we're going to find evidence of tool manufacture in this time period, we're probably going to have to go to where the stones are and look there," he says.

# The New York Times

## Science

### Lucy's Kin Carved Up a Meaty Meal, Scientists Say

By JOHN NOBLE WILFORD

Published: August 11, 2010



*Dikika Research Project*

*One of two fossilized bones from Dikika, Ethiopia, that show evidence of stone tool use.*

As early as 3.4 million years ago, some individuals with a taste for meat and marrow — presumably members of the species best known for the skeleton called Lucy — apparently butchered with sharp and heavy stones two large animals on the shore of a shallow lake in what



*Viktor Deak/California Academy of Sciences*

*An illustration of Australopithecus afarensis using stone tools.*

Scientists who made the discovery could not have been more surprised. They said the cut marks on a fossilized rib and thighbone were unambiguous evidence that human ancestors were using stone tools and sometimes consuming meat at least 800,000 years earlier than previously established. The oldest confirmed stone tools are less than 2.6 million years old, perhaps only a little before the emergence of the genus Homo.

Some prominent researchers of early human evolution were skeptical, saying the reported evidence did not support such claims.

If true, though, the new find reveals unsuspected behavior and dietary habits of the Lucy species, *Australopithecus afarensis*. Though no hominid fossils were found near the butchered bones, *A. afarensis* is thought to be the only species living in this region at the time. Their large teeth with thick enamel indicated they subsisted mainly on tubers and other vegetation.

So the international team of paleoanthropologists, archaeologists and geologists concluded that they had found the first evidence that kin of the 3.2-million-year-old Lucy had used some form of stone tools and would not pass up a chance to feast on a cut of meat and nutritious bone marrow.

Pending new discoveries, the discovery team wrote in a [report](#) being published Thursday in the journal [Nature](#), *A. afarensis* is the only hominid group “to which we can associate the tool use.” Whether these individuals made the tools or only selected naturally sharpened pieces of stone, the scientists added, was not yet determined. Nor is it known whether they were hunters or, more likely, scavengers of a lion’s leftovers.

In any case, the scientists concluded, the butchery evidence “offers a first insight into an early phase of stone tool use” by human ancestors, and it should “improve our understanding of how

this type of behavior originated and developed into later, well-recognized stone tool production technologies.”

The leader of the research project, at Dikika, Ethiopia, was Zeresenay Alemseged, an Ethiopian paleoanthropologist at the California Academy of Sciences in San Francisco. The lead author of the Nature paper was Shannon P. McPherron, an archaeologist at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany.

“Now, when we imagine Lucy walking around the east African landscape looking for food, we can for the first time imagine her with a stone tool in hand and looking for meat,” Dr. McPherron said in a statement issued by the Leipzig institute.

“With stone tools in hand to quickly pull off flesh and break open bones, animal carcasses would have become a more attractive source for food,” he said. “This type of behavior sent us down a path that later would lead to two of the defining features of our species — carnivory and tool manufacture and use.”

Dr. Alemseged said in a telephone interview before he returned last week to Ethiopia, “Our future work will be to find those stone tools that have shifted the framework for such an important transition in the behavior of our ancestors.”

David R. Braun, an archaeologist at the University of Cape Town in South Africa, who was not involved in the research, said “more surprises surely await us” at Dikika. In [an article accompanying the journal report](#), Dr. Braun noted that the conventional perception of *A. afarensis* as a relatively primitive species was already being reconsidered in some respects. He cited studies showing that “Lucy’s kin had body proportions that were more similar to those of humans than of apes.” Their short fingers, for example, “would allow the kind of fine-scale manipulation necessary for tool use,” he said. A recently discovered *afarensis* skeleton did not have an apelike thorax, the part of the body between the neck and abdomen, “usually associated with a large digestive tract and low-quality diet.”

Perhaps the new findings “should not have been so unexpected,” he said.

## Early humans used tools much earlier than we thought

August 11, 2010

By Nic Fleming



Our ancestors were carving meat some 800,000 years earlier than previously thought. Marks on fossilised animal bones found in Ethiopia indicate that early-human butchers were using stone tools as early as 3.4 million years ago.

Shannon McPherron of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and colleagues say the find is evidence that *Australopithecus afarensis* – the only known hominin species present in the region at the time – used tools.

The finds suggest that the evolution of toolmaking and meat-eating among our human ancestors is more complex than existing theories admit.

They also add to a growing body of evidence that *A. afarensis* may have been more human-like and less primitive than some have assumed.

"What we have done is push back in time, rather dramatically, two of the more fundamental behaviours that played such an important role in our evolution – meat consumption and tool use," says McPherron. "This find forces us to rethink the idea that the origins of stone tool use, meat consumption and the origins of our genus *Homo* all occurred together, around 2.5 million years ago."

Instead, he says, it's likely that hominins at least experimented with stone tools to help them eat meat and marrow much earlier. "It's quite exciting from that point of view," he says.

McPherron discovered the rib of a cow-sized animal and the thigh bone of a goat-sized antelope in January last year while carrying out fieldwork for the Dikika Research Project in northern Ethiopia. The surface of both bones carried deep markings suggestive of stone tools.

Detailed analysis using environmental scanning electron microscopy ruled out trampling by other animals as a possible cause for the marks. The team concluded the markings were made by sharp-edged stone tools used to cut and scrape flesh off the bones, and a blunt tool used to crack the bones open to get at nutrient-rich bone marrow.

The bones were found in sediment known to be at least 3.2 million years old, but other geological evidence suggests they are likely to be around 3.39 million years old.

That's 800,000 years earlier than the previous oldest known tools. Research published in 1997 identified surprisingly sophisticated sharp stone tools from the Gona region of Ethiopia, dating back to between 2.6 and 2.5 million years ago, as the earliest known artefacts in the world.

Many archaeologists and anthropologists thought at the time that the sophistication of these tools suggested that older ones were waiting to be found. The latest find proves them right.

Both McPherron's find and the 1997 Gona discovery predate the first known Homo species. Homo habilis – the first recognisably human-like hominin in the fossil record – lived only from around 2.4 to 1.4 million years ago and is known to have used tools to eat large quantities of meat.

It now looks like A. afarensis was the first human ancestor to wield tools. Famous for being the group that Lucy belonged to, it is the only early human known to have been present in the region 3.39 million years ago.

McPherron's team could not tell whether the bone markings had been made by tools that had been knapped for the purpose or had occurred naturally.

"If this is confirmed, it is a very important finding," says Chris Stringer, an anthropologist at the Natural History Museum in London. "Many people familiar with the material from 2.6 million years ago thought there might be older material out there.

"These findings represent the smoking gun, but the tools should be there too. That is something people must look at more closely, possibly in existing collections. These tools will be extremely simple, perhaps just a couple of flakes knocked off a core, so it will require extremely good preservation to identify them."



**REUTERS** AFRICA

## **Butchered bones give proof of earlier meat eating**

Aug 11, 2010

Find pushes back date of tool use by 1 million years

Tool-marked bones likely 3.4 million years old

CHICAGO Aug 11 (Reuters) - Evidence from ancient bones found in Ethiopia suggest human ancestors were using stone tools to carve meat a million years earlier than previously thought, an international team of researchers said on Wednesday.

Fossilized bones unearthed in the Afar region of Ethiopia by a team from the California Academy of Sciences reveal grooves and cut marks where tools were used to cut meat away from bones, or used to break bones to extract marrow, they reported in the journal Nature.

The tool-marked bones date to about 3.4 million years ago. Before the find, the oldest evidence of butchering with stone tools dated to about 2.5 million years ago.

"This discovery dramatically shifts the known time frame of a game-changing behavior for our ancestors," Dr. Zeresenay Alemseged, who led the team, said in a statement.

"Tool use fundamentally altered the way our early ancestors interacted with nature, allowing them to eat new types of food and exploit new territories. It also led to tool making -- a critical step in our evolutionary path," he said.

The butchered bones were found near the site where Alemseged's team in 2000 discovered "Selam," a pre-human girl who lived about 3.3 million years ago.

"After a decade of studying Selam's remains and searching for additional clues about her life, we can now add a significant new detail to her story," Alemseged said.

He said it is likely that Selam carried stone shards and helped her family butcher animal remains.

"This type of behavior sent us down a path that later would lead to two of the defining features of our species -- carnivory and tool manufacture and use," Dr. Shannon McPherron, archeologist with the Dikika Research Project in Ethiopia and the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, said in a statement. (Reporting by Julie Steenhuisen; editing by Mohammad Zargham)



## The First Butchers?

By Ann Gibbons

August 11, 2010



*Butchered bone?* These marks may offer the first evidence of butchery and meat-eating in human evolution.  
Credit: Dikika Research Project

Marks on the bones of two antelopes uncovered in Ethiopia may indicate that hominids were using sharp stones to butcher their meat 3.4 million years ago. If so, the discovery represents the earliest evidence of stone tool use by a human ancestor. "This find will definitely force us to revise our textbooks on human evolution, since it pushes the evidence for tool use and meat eating in our family back by nearly a million years," says paleoanthropologist Zeresenay Alemseged of the California Academy of Sciences in San Francisco.

The age of the cut marks pegs them as the handiwork of *Australopithecus afarensis*, a species made famous by the 3.2-million-year-old partial skeleton nicknamed Lucy, says Alemseged. That suggests our ancestors were already using sharp stones to cut meat when their brains and bodies were barely bigger than a chimpanzee's. Although the earliest known stone tools don't appear until 800,000 years later—also in Ethiopia—the marked bones may offer a glimpse of the first stage of tool use, when hominins were beginning to use sharp rocks but perhaps not yet making their own stone flakes.

In January 2009, Alemseged and other members of an international team of researchers—known as the Dikika Research Project—found the bones in the Afar Depression of Ethiopia. The researchers were using a new method to collect every scrap of bone from large mammals so they could reconstruct the ancient environment there. Archaeologist Shannon McPherron of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, says he picked up an unimpressive rib from a cow-sized ungulate and saw two "obvious, V-shaped cut marks." A few moments later, he found a thighbone shaft from a goat-sized antelope, with many marks on it. "In this case, they were incredibly obvious cut marks. But they were so old, we wanted to play it cautious," says McPherron.

Back at camp, the researchers examined the bones under a microscope and felt confident that the marks were made when a hominin cut flesh from the bones and pounded the bones open for marrow. Later, the bones were given to paleoanthropologist Curtis Marean of Arizona State University, Tempe, who showed that the marks were made by stone rather than by carnivore teeth. Other members of the team used secondary electron imaging and energy-dispersive x-ray spectrometry to show that the marks were created before the bones fossilized and also found a tiny piece of rock embedded in a cut mark, perhaps left during the butchering.

Radiometric dating of the sediments at the site shows the marked bones date to almost 3.4 million years ago—a time when the only known hominin in east Africa was *A. afarensis*. To butcher ungulates as large as a cow, the researchers say, *A. afarensis* must have ventured into dangerous terrain to compete with other carnivorous scavengers, such as hyenas. The team [reports](#) its findings in the 12 August issue of *Nature*.

"This is really a very exciting find," says archaeologist David Braun of the University of Cape Town in South Africa, who was not involved with the work. "This find emphasizes that tool use and carnivory have very deep roots in human ancestry." Others, though, say it will take stone tools—and marks on more than two bones—to prove that hominins, rather than crocodiles or other animals, made those cuts. "Extraordinary claims demand extraordinary evidence," says paleoanthropologist Tim White of the University of California, Berkeley.

## Lucy's kind used stone tools to butcher animals African fossils bear 3.4-million-year-old traces of tool-using carnivores.

By Bruce Bower

August 11, 2010



**Meaty Marks**Two animal bones found in Ethiopia display damage consistent with the use of stone tools to remove meat and marrow around 3.4 million years ago. Dikika Research Project

For Lucy and her ancient hominid comrades, raw meat sliced off animal carcasses was what's for dinner. That's the implication of a new study, published in the Aug. 12 *Nature*, describing butchery marks made by stone implements on two animal bones from about 3.4 million years ago.

If the new analysis holds up, it provides the oldest known evidence of stone-tool use and meat eating by members of the human evolutionary family. It's also the first sign of such behavior in hominids preceding the *Homo* lineage, say anthropologist Shannon McPherron of the Max Planck Institute for Evolutionary Anthropology in Leipzig and her colleagues.

McPherron's group made the discovery in Ethiopia's Dikika research area. Study coauthor Zeresenay Alemseged of the California Academy of Sciences in San Francisco previously unearthed a 3.3-million-year-old skeleton of an *Australopithecus afarensis* child at Dikika.

There's no way to know whether the Dikika bones display marks made by intentionally produced stone tools or by sharp rocks found on the landscape. Until now, the oldest animal bones bearing stone-tool butchery marks came from another Ethiopian site, Bouri, and dated to 2.5 million years ago (*SN*: 4/24/99, p. 262). Researchers found the oldest known stone tools, estimated to be 2.6 million to 2.5 million years old, at nearby Gona, Ethiopia. Those implements were carefully fashioned from select types of rock, suggesting that stone toolmaking had begun much earlier.

Most scientists suspect that an early *Homo* species made and used stone tools at Bouri and Gona. A long-standing hypothesis holds that meat eating enabled by stone implements rapidly spurred *Homo* evolution after 2.5 million years ago, especially brain enlargement.

“Our finds show that meat eating began much deeper in time and did not lead immediately to the origins of the genus *Homo* and associated biological changes, particularly larger brains,” McPherron says.

*A. afarensis* — best known for Lucy, a 3.2-million-year-old partial female skeleton excavated in Ethiopia in 1974 — now assumes the mantle of oldest known carnivorous wielder of stone tools. Lucy’s kind lived in East Africa from about 4 million to 3 million years ago. Only *A. afarensis* fossils have been found at Dikika.

No evidence of hunting or fire use exists for Lucy’s species. Her kind must have competed with other scavengers to salvage meat from animal carcasses, McPherron proposes.

The new finds add to growing evidence that *A. afarensis* behaved in relatively advanced ways, archaeologist David Braun of the University of Cape Town in South Africa remarks in a comment published in the same issue of *Nature*. Lucy’s kind had fingers short enough to manipulate stone tools and a humanlike ribcage that would have accommodated a digestive tract capable of processing large amounts of meat.

Archaeologist Alison Brooks of George Washington University in Washington, D.C., says the Dikika fossils provide preliminary support for her view that ancient primates employed stones as tools even before the origin of hominids around 7 million years ago. Brooks notes that modern chimpanzees and capuchin monkeys use stones to crack nuts

Stone toolmaking began earlier than 2.6 million years ago, in her view. Abundant stone artifacts at Gona reflect a move toward large-scale tool production at special sites, Brooks posits.

McPherron’s contention that Lucy’s kind used stones to cut meat off animal carcasses “seems plausible, but the case isn’t proven yet,” remarks archaeologist John Harris of Rutgers University in New Brunswick, N.J.

Next year McPherron’s team will expand its search for stone tool–modified bones at Dikika.

One of the bones described in the new report, a rib fragment, comes from a cow-sized mammal. The other bone comes from the upper leg of a goat-sized mammal. These fossils lay between volcanic deposits previously dated to 3.24 million and 3.42 million years ago, but are much closer to the older deposit.

Scanning electron microscopy indicated that sharp-edged stones had created incisions on the bones. Chemical analysis of bone surfaces showed that incisions had been made before fossilization occurred.

Cutting and scraping of meat yielded a distinctive pattern of cuts on both bones, McPherron's team asserts. One indentation contained a tiny, embedded piece of rock that likely chipped off a meat-cutting tool. Additional damage on the leg fossil resulted from hammering with a large stone, probably to obtain nutrient-rich marrow inside the bone.

Whether Lucy's kind made stone tools or collected sharp stones, they would have had to go 6 kilometers, or 3.6 miles, west of Dikika to find rocks suitable for butchering carcasses, McPherron says.

Transport of stones across that distance suggests to Braun that "the meat and marrow of large animals must have been a valued resource."



## **Almost a Million Years Added for Earliest Human Ancestor Stone Tool Use and Meat Eating**

By Steve Mirsky

August 11, 2010

Fossilized bones that show evidence of human ancestor stone tool use and meat eating push the earliest dates for those activities from about 2.5 million to 3.4 million years ago. Steve Mirsky reports

There's nothing like a good steak. And our *Australopithecus afarensis* ancestors apparently felt the same way. Because new discoveries from Ethiopia show that what was likely the species of the famous fossil Lucy used stone tools to butcher meat from big mammals—about 3.4 million years ago. That's a million years earlier than our best previous evidence for human ancestor stone tool use and meat eating. The finding appears on the cover of the journal *Nature*. [Shannon P. McPherron et al., <http://bit.ly/dzCs4d>]

The research team found two fossil bones with cut and scrape marks, signs of meat carving. One bone was a piece of rib from a cow-sized mammal; the other, a leg bone fragment from a mammal the size of a goat. The bones also had percussion marks, sustained while Lucy's friends smashed the bones to get at the marrow.

It looks like the ancient tool users collected stones that happened to have shapes conducive to butchering, the way kids select particular stones with good potential to skip on water. But future expeditions will look for evidence for any attempts at shaping stones into kitchen utensils. Because after 3.4 million years, Lucy and her fellow *afarensis* keep surprising us.

# SFGate

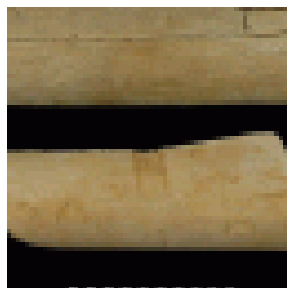
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AP Associated Press

## 'Lucy' species used stone tools, fossil study says

By MALCOLM RITTER, AP Science Writer



In a 2009 photo provided by the Dikika Research Project, project leader Dr. Zeresenay Alemseged excavates a freshly found 3.4 million years old Rhino fossil of a species that lived at the same time and place where the Australopithecus afarensis butchered carcasses using stone tools.



Two ancient animal bones from Ethiopia show signs of butchering by human ancestors, moving back the earliest evidence for the use of stone tools by about 800,000 years, researchers say.

The bones appear to have been cut and smashed some 3.4 million years ago, the first evidence of stone tool use by [Australopithecus afarensis](#), the species best known for the fossil dubbed "Lucy," says researcher [Zeresenay Alemseged](#).

"We are putting stone tools in their hands," said Alemseged ("Uh-lems-uh-ged") of the California Academy of Sciences, who reports the finding with colleagues in Thursday's issue of the journal Nature.

Some experts urged caution about the study's conclusions.

The study authors said the bones indicate the human ancestor used sharp stones to carve meat from the carcasses of large animals and other stones to smash bones to get at the marrow. One bone is a rib from a creature the size of a cow, and the other a leg bone from something the size of a goat. No stone tools were found at the site.

The researchers also called the finding the earliest evidence for meat-eating among hominins, an evolutionary group that includes people and their ancestors.

The study authors attributed the tool use to afarensis because no other hominin is known from that time in the area where the bones were found. The skeleton of a young afarensis female, dubbed "Selam," had previously been found about 200 yards away from the bone site. The Lucy fossil, which dates to 3.2 million years ago, was discovered in the same general area in 1974.

Alemseged said afarensis probably scavenged carcasses rather than hunting live animals, and ate the meat raw. The researchers said it's not clear whether the stone tools were made or were simply stones that were used as tools. But they plan to look for evidence of tool-making.

Alemseged also said that as some afarensis stripped meat from a carcass, others probably stood guard to ward off predators in return for some of the meat, which would indicate a degree of cooperative behavior.

Until now, the earliest sign of tool use dated to about 2.6 million years ago, also in Ethiopia. It's not clear who used those tools.

Some experts were unconvinced by the Nature paper's arguments.

"I'm very cautious about the conclusions," said Nicholas Toth of [Indiana University](#), a paleoanthropologist who studies early stone tools.

The bones were found on the surface rather than being excavated, he said. That means nobody knows exactly what layers of earth they came from, which is key to knowing their age and associating them with other bones and materials to give them context, he said.

What's more, judging from photos in the Nature paper, the bone markings differ from the marks typically left by stone tools, he said. That raises questions about whether they were actually caused by trampling or animal bites, Toth said.

In fact, those markings look like the work of crocodiles, said Tim White of the [University of California, Berkeley](#). And they don't appear in the places on the bones that one would expect from a butchering, he said.

He also said that 30 years of searching has failed to find any stone tools as old as the bones. "It's not like people haven't been looking. People have been looking intensively," he said.

"An extraordinary claim requires extraordinary evidence," White said. "The evidence is very thin here, and very ambiguous."

But Bernard Wood of [George Washington University](#) declared, "I'd be willing to bet a month's salary that those are cut marks (from stone tools) and not tooth marks."

Wood compared the find to the famous 1978 discovery of tracks in Tanzania that showed upright walking 3.6 million years ago, most likely by afarensis.

The bone markings "are as significant a statement about early hominin behavior as the [Laetoli footprints](#) are about hominin locomotion," Wood said. While it's reasonable to assume that afarensis wielded the tools, he said, Alemseged's ideas about the butchers being guarded by other afarensis in exchange for meat is "pushing the envelope a bit far."

Wood also said the finding suggests afarensis ate meat but doesn't prove it, because maybe they cut off animal flesh just to get to the marrow.

## Hail Lucy! – the new Queen of the Stone Age

**An archeological find has added a new chapter to the history of humans and could shift the Stone Age back almost one million years.**

By Richard Alleyne

August 11, 2010

Scientists have discovered evidence of the use of stone tools to eat meat 3.4 million years ago – 800,000 years earlier than previously thought.

The find means that our first ancestor to use tools was not Homo "the handy man" Habilis but Australopithecus afarensis, the half ape, half human, nicknamed "Lucy" when her skeleton was found in 1976.

The team led by Dr Zeresenay Alemseged from the California Academy of Sciences discovered two fossil animal bones dating back 3.4 million years that had evidence of being cut and having their marrow extracted with a stone tool.

The find in Ethiopia, close to where Lucy was found in 1976, means that our ancestors first use of technology was nearly a million years earlier than first thought.

"This find will definitely force us to revise our text books on human evolution, since it pushes the evidence for tool use and meat eating in our family back by nearly a million years," said Dr Alemseged.

"These developments had a huge impact on the story of humanity."

His colleague Dr Shannon McPherron, an archeologist at the Max Planck Institute for Evolutionary Anthropology, said: "This is pushing the Stone Age back 800,000 years.

"It is profound. We can now picture Lucy walking around the east African landscape with a stone tool in her hand scavenging and butchering meat.

"With stone tools in hand to quickly pull off flesh and break open bones, animal carcasses would have become a more attractive source of food.

"We have shown that two key aspects of our evolution – meat eating and stone tool use – took place much further back in our history."

Until now, the oldest known evidence of butchering with stone tools came from Bouri, Ethiopia, where several cut-marked bones were dated to about 2.5 million years ago, generally considered the beginning of the Stone Age.

The oldest known stone tools, dated to around the same time, were found at nearby Gona.

The new fossil bones marked by stone tools, described in Nature, were also found in Dikika, Ethiopia around 250 miles north east of Addis Ababa.

They were found just 200 yards from the site where Dr Alemseged's team discovered "Selam", dubbed Lucy's daughter in 2000, the youngest example of Australopithecus afarensis species ever found.

Both bones came from mammals—one is a rib fragment from a cow-sized mammal, and the other is a femur shaft fragment from a goat-sized mammal.

The bones are marked with cuts that suggest stone tools were used to remove the flesh from the bones and extract the bone marrow.

Radiometric tests showed they dated back 3.4 million years.

Dr Alemseged said the behaviour was a "game changing" event for mankind.

"Tool use fundamentally altered the way our early ancestors interacted with nature, allowing them to eat new types of food and exploit new territories," he said.

"It also led to tool making—a critical step in our evolutionary path that eventually enabled such advanced technologies as aeroplanes, MRI machines, and iPhones."

Professor Fred Spoor, of University College London, hailed the discovery as a new "chapter" in the history of humans.

"It is a major step forward and we have been waiting for this for na long time. We don't have to disregard everything from before but we have to add a new chapter," he said.

# THE HINDU

**First use of stone tools pushed back by 8 lakh years**

**Hominin species — *Australopithecus afarensis* — became meat eaters 3.4 million years ago?**

August 11, 2010



**Sharp stone cuts: Two parallel cut marks made by stone tools cutting into tissues on the rib of a cow-sized or larger ungulate (hoofed mammal).**

So when did hominins (members of human lineage) start using stone tools for the first time? Until recently, based on available evidence, it was presumed that the use of stone tools by hominins dates back to about 2.5 million years ago.

But a paper published online today (Aug 12) in *Nature* has pushed the date back by about 8,00,000 years to make it nearly 3.4 million years ago. “Our discovery extends by approximately 800,000 years the antiquity of stone tools,” note the authors.

The actual stone tools used by hominins 3.4 million years ago have not been found. The inference is therefore drawn based on tool marks found on bones.

Earlier record

The discovery was made from bones found in sedimentary deposits near Gona, Ethiopia. Earlier record of stone tools usage, some 2.6 million years ago, came from several localities in Ethiopia and Kenya.

The sand deposits where the bones were found were not strongly cemented, and this had enabled the tools marks to be well preserved. Scientific evidence clearly indicates the tool marks were formed prior to fossilisation of bones.

Three types of stones

Three different types of tool marks — cutting, scraping, and percussion are found on the bones. Interestingly, the marks are found on the bones of large mammals — a femur shaft fragment of a goat-sized mammal, and a right rib fragment of a cow-sized animal.

The researchers have, based on the morphology of the marks, ruled out the possibility of tooth-inflicted cuts. In fact, the marks indicate two different shaped stones used by hominins.

For instance, the cut marks indicate that sharp-edged stones were used for cutting and scraping the animal flesh, and blunt stones (producing the percussion marks) for crushing the bones to probably gain access to bone marrow.

What does the discovery mean for human evolution? Hominins, unlike what was believed till now, had started using stone tools nearly one million years earlier, and had become carnivorous and competed with other such animals for food.

“The bones presented here are the earliest evidence for meat and [bone] marrow consumption in the hominin lineage, pre-dating the known evidence by over 800,000 years,” note the authors.

Lucy used stone tools?

The age of the bones with tool marks coincides with the age when *Australopithecus afarensis* roamed east Africa. In all probability, Lucy and Selam, the most complete skeletons of *A. afarensis* discovered so far, would have walked around with such stone tools to eat animal flesh.

There is already sufficient scientific evidence to show that *A. afarensis* was not a relatively primitive hominin.

In fact, this species had body proportions similar to those of humans and apes, its fingers were relatively short, which would have “allow[ed] the kind of fine-scale manipulations necessary for tool-use,” notes a piece published in the News and Views section of *Nature*.

Earlier conclusion

The latest discovery of bones with stone tool marks reaffirms the earlier conclusion based on the study of another *A. afarensis* fossil — this hominin species surely did not eat a low-quality diet.

“Until now, there has been no direct evidence that meat and marrow formed a part of the diet of hominins at this early age. ...It is notable that these early humans departed from the typical primate pattern of disregarding relatively large animals as food,” notes the News and Views piece.

Unknown fact

But what is not known is whether this hominin species made sharp-edged stone tools by chipping the rocks or just used some naturally occurring ones. But one thing is clear — the hominins did not find such sharp-edged stones at the site where the bones were found.

The sedimentary environment from where the tool-marked bones were recovered had pebbles that are too small to create sharp-edged stones. The authors thus envisage that the *A. afarensis* species carried these stone tools with them.

## Find Suggests Tool Use Began Before Humans

Researchers Say Fossils Uncovered in Ethiopia Push Back the Beginnings of Technology by Almost One Million Years

By Robert Lee Hotz

August 12, 2010

An international research team working in Ethiopia has unearthed what it considers the earliest known traces of the use of stone tools, a discovery that could push back the advent of technology by nearly a million years to a time before the evolution of the human family.

But the researchers did not discover any actual stone tools or direct links to the long-extinct creatures that may have wielded them, and the report has set off a debate about the interpretation of the finding.

The discovery, reported in the British journal *Nature* on Wednesday, consists of two fossil animal bones dating to about 3.4 million years ago and etched with distinctive V-shaped grooves. Primordial butchers using sharp stones to fillet a carcass in ancient East Africa made the marks, the researchers said.

"It pushes back tool use almost a million years," said archaeologist Shannon McPherron at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, who discovered the bones last year at Dikika, about 300 miles from Addis Ababa.

If confirmed by more fieldwork, the distinctive marks would herald the first appearance of a basic impulse to innovate that, in time, led from the development of stone tools to the invention of screwdrivers, researchers say.

"All the sophisticated technology we have today is because this early ancestor decided to pick up a stone and use it as a tool," said anthropologist Zeresenay Alemseged at the California Academy of Sciences, who oversees research at Dikika.

Until now, the oldest known stone tools dated to about 2.5 million years ago. Those implements, of which thousands were found in East Africa, are thought to be the work of an early human species. The older find announced Wednesday, however, would predate the evolution of the human family, known as the genus *Homo*, and raises new questions about the role of tools in spurring human evolution. They may have initiated a shift in pre-humans' diet, which in turn may have aided the development of larger brains.



"To see this change in behavior shifted so far back in time is surprising," said anthropologist David Braun at the University of Cape Town in South Africa.

Dr. McPherron and his colleagues found the two scratched bones just a few hundred yards from the spot where a decade ago the researchers discovered the oldest known skeleton of a child—a juvenile female from a pre-human species called *Australopithecus afarensis*, the same species as the iconic fossil "Lucy." It is the first suggestion that this small-brained species, which thrived in Africa for almost a million years, may have used tools or eaten meat.

Although the evidence is scant, several experts in human evolution found it credible.

"I find it plausible," said paleoanthropologist John Harris, an authority on early stone tools at Rutgers University, who was not involved in the work. Modern monkeys and chimpanzees often use tools to aid their search for food, he said. They pound nuts with rocks and probe for insects with sticks fashioned for the purpose. The early ape-like species that roamed the grasslands and wooded glades of Africa before the evolution of the human family may have been no less handy.

"It argues strongly that there may have been tool use much earlier in our history," Dr. Harris said.

Others questioned the find. "It is an extraordinary claim, but the evidence is weak and ambiguous," said anthropologist Tim White at the University of California at Berkeley. "We should be extremely skeptical."

Instead, prehistoric crocodiles could have made the tool-like marks as they gnawed flesh from the bones, or passing herds may have trampled the remains underfoot. "Researchers who study bone-surface modifications from archeological sites have shown that fresh bones trampled by animals can create marks that mimic stone-tool cut marks," said Indiana University anthropologist Sileshi Semaw.

In an attempt to dispel these doubts, Curtis Marean at Arizona State University's Institute of Human Origins, who specializes in studying such bone marks, analyzed the specimens. By examining the regularity and surface of the marks, he says he has eliminated the possibility they could have been made by teeth or hooves.

"I am as confident as possible that those are stone-tool-inflicted marks on those two bone fragments," said Dr. Marean. "I have no doubts."



## **New Find Pushes Age of Stone Tools Back A Million Years**

By Jess McNally

August 11, 2010



The genus *Homo* is no longer the sole primate lineage known to have used stone tools to consume the meat of large mammals. New research pushes that skill back nearly a million years.

Large fossilized animal bones with ends shattered for sucking out marrow and cut marks deliberately made with sharp stone tools have been found just a few hundred feet from a previously uncovered *Australopithecus afarensis* skeleton. The bones are roughly 3.4 million years old, and connect the earliest evidence for using stone tools and eating large game to our [Lucy-like ancestors](#).

Previously, the earliest evidence for using tools to cut the meat off large animals was attributed to early *Homo* in the Gona region of Ethiopia around 2.5 million years ago. This find from a different region in Ethiopia, Dikika, shows the behavior was around at least a million years earlier.

“It means almost everything to be able to use stone tools,” said paleontologist Zeray Alemseged of the [California Academy of Sciences](#), co-author of the discovery announced August 12 in *Nature*. “The picture that we’re going to paint of *Australopithecus* is being transformed completely. We can now imagine them walking around carrying their tools. Tools that were the precursor of every tool that we have today.”

“*Australopithecus* was a very primitive, ape-like early human,” said biological anthropologist Craig Stanford at University of Southern California, who edited a book on meat eating and human evolution. “The fact that they were using tools and eating meat indicates this was something that was widespread very early in human history.”



The ability to carve meat off large mammal carcasses likely put *Australopithecus* in competition with dangerous scavengers, Alemseged says. It is unlikely they were hunting for the large game because their body shape would not have allowed them to run fast, which is necessary to chase down an antelope or similar sized animal.

But scavenging large animals still provides access to high quality, high calorie foods that likely enabled *Australopithecus* [to venture much further out](#) of the forest environment into the open grassland than otherwise possible on a diet of mostly of fruit, leaves and tubers.

The two cut bones found both came from mammals. One is a rib from a cow-sized animal, and the other is a femur shaft from an antelope-sized animal. Analysis of the bones showed the cut

marks were created before the bones fossilized, eliminating the possibility the marks were made recently.

While it is impossible to tell from the scratches whether *Australopithecus* was making stone tools or using naturally sharp rocks, the lack of adequate rock material in the immediate area where the bones were found suggests they were carrying the stones around with them from one place to another.

However, no one has yet found the stone tools themselves or where they could have come from, and at least one scientist finds this reason to be skeptical of the claims made by the discoverers.

“The fact that no single sharp-edged flaked stone has been recovered from the site makes such a claim doubtful of any hominid involvement,” said paleontologist Sileshi Semaw of the [Stone Age Institute](#), who discovered what was previously the oldest evidence for stone tool from the Gona region. “Researchers who study bone surface modifications from archeological sites have shown that fresh bones trampled by animals can create marks that mimic stone tool cut marks.”

“The next stage will be to really go out there and scrutinize the site to see if the tools are indeed there,” said Alemseged in response. “But I wouldn’t be surprised if the stone tools were archeologically invisible to us. They might have been using the tools in a sporadic way.”



## 'Lucy' species used stone tools, fossil study says

August 11, 2010

By MALCOLM RITTER AP Science Writer © 2010 The Associated Press

Aug. 11, 2010, 4:26PM

NEW YORK — Two ancient animal bones from Ethiopia show signs of butchering by human ancestors, moving back the earliest evidence for the use of stone tools by about 800,000 years, researchers say.

The bones appear to have been cut and smashed some 3.4 million years ago, the first evidence of stone tool use by *Australopithecus afarensis*, the species best known for the fossil dubbed "Lucy," says researcher Zeresenay Alemseged.

"We are putting stone tools in their hands," said Alemseged ("Uh-lems-uh-ged") of the California Academy of Sciences, who reports the finding with colleagues in Thursday's issue of the journal *Nature*.

Some experts urged caution about the study's conclusions.

The study authors said the bones indicate the human ancestor used sharp stones to carve meat from the carcasses of large animals and other stones to smash bones to get at the marrow. One bone is a rib from a creature the size of a cow, and the other a leg bone from something the size of a goat. No stone tools were found at the site.

The researchers also called the finding the earliest evidence for meat-eating among hominins, an evolutionary group that includes people and their ancestors.

The study authors attributed the tool use to *afarensis* because no other hominin is known from that time in the area where the bones were found. The skeleton of a young *afarensis* female, dubbed "Selam," had previously been found about 200 yards away from the bone site. The Lucy fossil, which dates to 3.2 million years ago, was discovered in the same general area in 1974.

Alemseged said *afarensis* probably scavenged carcasses rather than hunting live animals, and ate the meat raw. The researchers said it's not clear whether the stone tools were made or were simply stones that were used as tools. But they plan to look for evidence of tool-making.

Alemseged also said that as some *afarensis* stripped meat from a carcass, others probably stood guard to ward off other animals in return for some of the meat, which would indicate a degree of cooperative behavior.

Until now, the earliest sign of tool use dated to about 2.6 million years ago, also in Ethiopia. It's not clear who used those tools.

Some experts were unconvinced by the Nature paper's arguments.

"I'm very cautious about the conclusions," said Nicholas Toth of Indiana University, a paleoanthropologist who studies early stone tools.

The bones were found on the surface rather than being excavated, he said. That means nobody knows exactly what layers of earth they came from, which is key to knowing their age and associating them with other bones and materials to give them context, he said.

What's more, judging from photos in the Nature paper, the bone markings differ from the marks typically left by stone tools, he said. That raises questions about whether they were actually caused by trampling or animal bites, Toth said.

In fact, those markings look like the work of crocodiles, said Tim White of the University of California, Berkeley. And they don't appear in the places on the bones that one would expect from a butchering, he said.

He also said that 30 years of searching has failed to find any stone tools as old as the bones. "It's not like people haven't been looking. People have been looking intensively," he said.

"An extraordinary claim requires extraordinary evidence," White said. "The evidence is very thin here, and very ambiguous."

But Bernard Wood of George Washington University declared, "I'd be willing to bet a month's salary that those are cut marks (from stone tools) and not tooth marks."

Wood compared the find to the famous 1978 discovery of tracks in Tanzania that showed upright walking 3.6 million years ago, most likely by afarensis.

The bone markings "are as significant a statement about early hominin behavior as the Laetoli footprints are about hominin locomotion," Wood said. While it's reasonable to assume that afarensis wielded the tools, he said, Alemseged's ideas about the butchers being guarded by other afarensis in exchange for meat is "pushing the envelope a bit far."

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## Lucy utilisait déjà des outils en pierre

August 11, 2010

Mots clés : [Lucy](#), [australopithèque](#), [Éthiopie](#)

Par [Jean-Luc Nothias](#)



Le Dr Zeresenay Alemseged, de la California Academy of Sciences (à gauche), a dirigé les fouilles en Éthiopie. Crédits photo : Credit: Dikika Research Project,

## **Des os fossilisés vieux de 3,4 millions d'années éclairent d'un jour nouveau les premiers pas de l'humanité.**

Cela réjouit le monde de la recherche des origines de l'homme mais cela n'étonne pas outre mesure. Nombreux étaient les scientifiques qui espéraient ce genre de découverte. Deux os fossilisés, un bout de fémur d'un animal de la taille d'une chèvre et un bout d'une côte d'un animal gros comme une vache prouvent qu'il y a 3,4 millions d'années, des hominidés, les australopithèques, vivant dans ce qui est maintenant l'Éthiopie, utilisaient des outils de pierre et mangeaient de la viande. Les os, examinés sous toutes les coutures, présentent des traces caractéristiques de grattage et de coupure pour arracher les chairs et même sans doute extraire la moelle des os selon [une étude que publie la revue Nature](#).



Les entailles sur ces os prouvent l'utilisation, à l'époque, d'outils en pierre pour la découpe de la viande.

«Cette découverte avance considérablement le moment à partir duquel nos ancêtres ont changé complètement les règles du jeu », estime le Dr Zeresenay Alemseged, de la [California Academy of Sciences](#), responsable des fouilles dans le cadre du projet de recherche de Dikika. En effet, on n'avait pas encore trouvé de traces claires d'utilisation d'outils de pierre avant 2,5 millions d'années. Voilà 800.000 ans de gagnés.

### **Examen par spectrométrie**

«C'est un papier très sérieux, très solide, estime Yves Coppens, professeur au Collège de France, l'un des découvreurs, en 1974, de Lucy, une australopithèque qui vivait dans cette région à la même période. Il n'y a pas de doute. Et je ne dis pas cela parce que je connais très bien le Dr Alemseged puisque j'ai dirigé la thèse qu'il a réalisée à Paris. D'ailleurs, tout le monde l'appelait et l'appelle encore “Zeray” pour simplifier.»

Ce chercheur éthiopien est le découvreur, en 2000, à 4 kilomètres du lieu où reposait Lucy, du squelette d'une jeune australopithèque morte à l'âge d'environ 3 ans, baptisée Selam (ce qui veut dire «paix»), que certains appellent la «fille de Lucy». Elle a pourtant vécu il y a 3,3 millions d'années, soit 200.000 ans avant Lucy.



Deux os fossilisés d'animaux ayant 3,4 millions d'années.

Les deux os fossiles ont été trouvés à 200 mètres de l'endroit de la découverte de Selam. Les datations, dans ces terrains volcaniques, ont été faites avec la même méthode qui avait servi à déterminer l'âge de Lucy et de Selam. Les examens au microscope électronique et par

spectrométrie ont permis de caractériser les traces présentes sur les os mais aussi de prouver qu'elles avaient été faites avant la fossilisation.

### **«Un changement de régime alimentaire»**

«Maintenant, lorsqu'on imagine Lucy marchant à la recherche de nourriture en Afrique de l'Est, nous la voyons pour la première fois avec un outil en pierre à la main, recherchant de la viande», relève Shannon McPherron, dans un communiqué de l'Institut Max-Planck d'anthropologie évolutionnaire de Leipzig (Allemagne).

Pour Dominique Cauche, archéologue à la grotte du Lazaret (université de Nice), spécialiste des premières industries lithiques, «c'est une très belle et très importante découverte. On présentait que les australopithèques devaient avoir utilisé des outils, c'est maintenant chose démontrée. Et ce qui serait encore mieux maintenant, ce serait de trouver ces outils ». Les fouilles vont se poursuivre car l'une des questions qui restent ouvertes est celle de savoir si ces australopithèques ramassaient des pierres coupantes ou s'ils les taillaient.

Pour le Dr Alemseged, l'utilisation de tels outils, naturels ou fabriqués, permettant à nos ancêtres de consommer la viande de grosses carcasses, «leur a ouvert la compétition risquée avec d'autres carnivores », les poussant sans doute à s'engager dans un travail d'équipe. «J'ai toujours pensé et écrit que cette période privilégiée, surtout du point de vue climatique, avait été le théâtre d'un changement de régime alimentaire, insiste Yves Coppens. Nous avons d'ailleurs trouvé, lors de nos fouilles dans le sud-ouest de l'Éthiopie, dans la vallée de l'Omo, entre 1967 et 1976, des outils en quartz clairement taillé qui ont été datés de 2,5 millions d'années mais qui en fait doivent être plus anciens, sans doute 3,2 à 3,3 millions d'années. » Le destin de l'humanité, avec cette accession à l'omnivorerisme, s'est donc certainement joué à ce moment-là.

<http://www.lefigaro.fr/sciences-technologies/2010/08/11/01030-20100811ARTFIG00511-lucy-utilisait-deja-des-outils-en-pierre.php>

# The Telegraph

calcutta, india

## Older, tools & taste for meat

August 11, 2010

G.S. MUDUR



**New Delhi, Aug. 11:** Two bone fragments embedded in layers of ancient volcanic deposits in Ethiopia have provided scientists the earliest evidence of stone tool use and meat eating by ancestors of humans 3.4 million years ago.

An international team of researchers has identified cuts and strike marks on the bones that could push the antiquity of tools by some 800,000 years.



Until now, the oldest evidence of stone tool production had come from Gona in Ethiopia, where scientists found tools 2.6 million years old — from the reign of a human ancestor *Homo habilis*.

In tomorrow's issue of the journal *Nature*, an eight-member team has described 3.4-million-year-old bones from a site called Dikika with unambiguous stone tool marks. The bones — a rib fragment of a cow-sized mammal and a thigh bone of a goat-sized hoofed animal — show cuts for removal of flesh and percussion marks indicating the use of blunt stones, possibly to extract the marrow.

(From top)The two bone fragments; project leader Zeresenay Alemseged. Dikika Research Project

“Meat eating and stone tool use are now pushed deeper into our evolutionary history — to a time long before the first members of the genus *Homo* appear,” said Shannon McPherron, an American paleolithic archaeologist working at the Max Planck Institute of Evolutionary Anthropology, Germany, and a team member.

Scientists believe the only species that could have used stone tools in this way at the time was *Australopithecus afarensis*, the earliest full-time bipedal creature that lived in the region from 3.9 million years ago to 2.8 million years ago. “This is the first time that stone tool use and meat eating have been associated with this species — *Australopithecus afarensis*,” McPherron said.

The scientists said it was unclear whether *Australopithecus afarensis* used naturally-occurring sharp-edged stones or were making tools.

The most famous among *Australopithecus afarensis* skeletons was named Lucy, a creature that lived about 3.2 million years ago, whose remains were discovered in 1974.

The new bones were found near a site where Ethiopian and US scientists had found a young *Australopithecus afarensis* skeleton — named Selam. “It is likely that Selam carried stone flakes and helped... her family as they butchered animal remains,” said Zeresenay Alemseged, Dikika project leader at the California Academy of Sciences.



## **Stone tools used by earliest 'butchers'**

August 11, 2010

SAN FRANCISCO, Aug. 11 (UPI) -- Researchers say evidence from Africa shows humans were using tools to butcher meat from large animals millions of years earlier than previously thought.

Scientists from the California Academy of Sciences found fossilized bones in Ethiopia from around 3.4 million years ago bearing evidence of stone tool cut marks made while carving meat off them, an academy release said Wednesday.

The bones are the first evidence that *Australopithecus afarensis*, early humans, used stone tools and consumed meat.

"This discovery dramatically shifts the known time frame of a game-changing behavior for our ancestors," Zeresenay Alemseged, curator of anthropology at the academy, said.

"This find will definitely force us to revise our text books on human evolution, since it pushes the evidence for tool use and meat eating in our family back by nearly a million years.

"Tool use fundamentally altered the way our early ancestors interacted with nature, allowing them to eat new types of food and exploit new territories," he said.

# EL PAÍS

## Los homínidos ya usaban herramientas para conseguir carne hace 3,4 millones de años

August 11, 2010

### Marcas en dos huesos hallados en Etiopía, primer paso para reescribir la historia de la evolución humana

MALEN RUIZ DE ELVIRA - Madrid - 11/08/2010

Solo dos huesos de grandes mamíferos hallados, como agujas en un pajar, en el desierto de Afar en Etiopía, bastan para cambiar el calendario de la evolución humana, según sus descubridores. Los restos fósiles son de hace 3,4 millones de años, cuando allí vivía un antepasado humano, un australopiteco, y las marcas que presentan no han podido ser hechas, explican estos expertos, más que por herramientas de corte y percusión.

Los huesos indican que la familia humana de la famosa Lucy (un ejemplar muy bien conservado de *Australopithecus afarensis*) ya utilizaban útiles de piedra para cortar carne de mamíferos de gran tamaño y para romper huesos con el objeto de extraer la médula. Las herramientas y los huesos con marcas más antiguos hallados hasta el momento se encontraron también en Etiopía y son unos 900.000 años más modernos, por lo que se pensaba que fueron homínidos del género actual, el Homo, y no australopitecos los que primero las utilizaron.

"Seguro que este hallazgo nos fuerza a revisar los libros de texto sobre la evolución humana, ya que hace retroceder la evidencia de uso de herramientas y consumo de carne en nuestra familia casi un millón de años", dice Zeresenay Alemseged, etíope y director del trabajo, que publica *Nature*. "Estas etapas tuvieron un enorme impacto en la historia de la humanidad".

"El uso de herramientas alteró de forma básica la forma en que nuestros antepasados más antiguos interaccionaban con la naturaleza, ya que les permitieron alimentarse de nuevas clases de alimentos y explotar nuevos territorios", recuerda Alemseged, director del [proyecto Dikika](#) en la Academia de Ciencias de California. "Y también desembocó en la fabricación de otras herramientas, cada vez más perfeccionadas".

Las nuevas pruebas fueron encontradas a sólo 200 metros de donde el mismo equipo descubrió en 2000 a Selam, el esqueleto de una niña australopiteca muy completo que se conoce en los ambientes paleontológicos como *La hija de Lucy*, lo que relaciona las supuestas herramientas con estos homínidos.

Los huesos son un fragmento de costilla de un animal del tamaño de una vaca y un fragmento de fémur de un antílope del tamaño de una cabra. Su análisis con técnicas avanzadas, como el microscopio electrónico y la espectrometría de rayos X han demostrado que las marcas observadas fueron hechas antes de que los huesos fosilizaran.

Lo que no saben los científicos es si las piedras utilizadas como herramientas eran naturales o se habían modificado para hacerlas más cortantes. No han encontrado las herramientas, ni indicios de que éstas fueran modificadas en el mismo lugar en que se usaron, pero pudieron haber sido trasladadas por los homínidos desde otro lugar en su búsqueda de animales muertos.



[http://www.elpais.com/articulo/sociedad/hominidos/usaban/herramientas/conseguir/carne/hace/34/millones/anos/elpepusoc/20100811elpepusoc\\_4/Tes](http://www.elpais.com/articulo/sociedad/hominidos/usaban/herramientas/conseguir/carne/hace/34/millones/anos/elpepusoc/20100811elpepusoc_4/Tes)

## Scientists: Human Ancestors Used Tools to Butcher Meat

August 11, 2010

[Hugh Collins](#)

(Aug. 11) -- It seems that our early ancestors had a taste for meat. And while steak knives were still millions of years in the future, the hominid known as "Lucy" and her species had the tools to satisfy their hunger.

A fossilized thighbone and rib of two animals found in Dikika, Ethiopia, show cut marks that scientists believe were made by Lucy's species -- *Australopithecus afarensis* -- butchering the animal with stone tools for food 3.4 million years ago, scientists report in today's issue of the journal *Nature*.

Previously, the earliest evidence of the use of tools was from less than 2.6 million years ago.



*Dikika Research Project, AP*

*This photo from Dikika Research Project shows the two stone tool modified bones from Dikika, Ethiopia, that scientists believe provide the oldest known evidence of tool use and meat eating by human ancestors.*

"Now, when we imagine Lucy walking around the east African landscape looking for food, we

can for the first time imagine her with a stone tool in hand and looking for meat," said Shannon McPherron, an archaeologist with the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, [according to The New York Times](#).

No hominid remains were found near the butchered bones, but *A. afarensis* is believed to have been the only hominid species living in the area. Lucy and her kind had large teeth with thick enamel, suggesting that they were mainly vegetarians. But once they acquired tools, a meaty snack could have become a possibility.

"With stone tools in hand to quickly pull off flesh and break open bones, animal carcasses would have become a more attractive source for food," McPherron said. "This type of behavior sent us down a path that later would lead to two of the defining features of our species -- carnivory and tool manufacture and use."

Not everyone is convinced that the bones prove that Lucy's species were meat eaters. The marks on the bones could have been made by animals, some scientists said.

Tim White of the University of California, Berkeley, [told The Associated Press](#) that the marks resemble the work of crocodiles, not evolving hominids butchering their next meal.

Then there's the fact that nobody has ever found tools that are as old as these bones.

"An extraordinary claim requires extraordinary evidence," White told the AP. "The evidence is very thin here, and very ambiguous."

Still, if true, the theory that these early ancestors were using tools to obtain meat could offer a fascinating insight into how human beings evolved.

Some scientists have speculated that enriching their diets with meat boosted hominid brain function in a feedback loop. The idea is that the "increased nutrients of meat allow you to grow a larger brain, which allows you to come up with novel solutions to make better stone tools, which allow you to get more meat," McPherron said, [according to National Geographic](#).

It may be possible that hominid tool use goes back even before Lucy's kind. The common ancestor of human beings and chimpanzees may have been wielding early steak knives 5 million years ago, said paleoanthropologist John Shea of Stony Brook University in New York.

"Humans and chimpanzees both habitually use tools, so it stands to reason that the last common ancestor was a tool user as well," he added.

Filed under: [World](#), [Science](#), [Tech](#), [Top Stories](#)

<http://www.aolnews.com/science/article/lucy-species-used-stone-tools-to-butcher-animals-scientists-say/19589977>

## Las herramientas, un millón de años más antiguas de lo que se pensaba

August 11, 2010



El investigador Zaeresenay Alemseged, en las excavaciones. [Nature

- Descubren huesos con marcas realizadas por 'Australopithecus afarensis'
- Fueron realizadas hace 3,4 millones de años con piedras afiladas
- Su hallazgo retrasa 800.000 años una habilidad que se consideraba humana

*Rosa M. Tristán* | Madrid

Los ancestros de la especie humana utilizaron herramientas mucho antes de lo se pensaba hasta ahora. Así se desprende del hallazgo de **unas marcas en huesos fosilizados** hallados al este de Etiopía, que fueron hechas con piedras.

Los fósiles ha servido para demostrar, según publican sus descubridores en 'Nature' esta semana, que los congéneres de la famosa "Lucy", es decir, **los 'Australopithecus afarensis' utilizaban, hace 3,4 millones de años, piedras afiladas** para sacar la carne de los huesos. Las muescas revelan que también los machacaban para llegar al tuétano, que tiene un alto valor nutritivo.

El descubrimiento **atrassa casi un millón de años** esta capacidad de los antepasados de nuestra especie; hasta ahora, las herramientas más antiguas aparecidas databan de hace 2,6 ó 2,5

millones de años, como recuerdan en sus trabajo Shannon McPherron, del Instituto Max Planck de Antropología Evolutiva de Alemania y el etíope Zeresenay Alemseged, de la Academia de Ciencias de California.

Estos utensilios **se atribuyen al 'Homo habilis'**, cuya capacidad craneal era ya un 40% mayor que la de un 'Australopithecus', en los que no es superior a la de un chimpancé.

Duarnte la campaña de 2009, los paleoantropólogos encontraron **una costilla** de un mamífero del tamaño de una vaca y **el fémur** de un antílope. Ambos tenían señales que, como se descubrió utilizando microscópios electrónicos y espectógrafos, eran de la misma época de los fósiles.

Por entonces, en aquella zona habitaban los 'Australopithecus afarensis' como Lucy, cuyo esqueleto, casi completo, se conoce desde 1974. "Cuando nos imaginamos a 'Lucy' recorriendo el paisaje del este de África para buscar comida, ahora la vemos por primera vez con una herramienta de piedra en la mano, en busca de carne", ha señalado McPherron.

Para su colega Alemseged, "el descubrimiento adelanta mucho el momento hasta ahora conocido a partir del cual nuestros antepasados cambiaron por completo las reglas de juego" porque el uso de estos utensilios de piedra **modificó la forma en la que explotaban el territorio** y podían consumir nuevos alimentos.

Lo que no **se sabe aún es si eran capaces también de fabricarlos**, dado que en el lugar donde aparecieron, con sedimentos volcánicos, no había piedras de la calidad precisa para hacer esos cortes, por lo que se cree que las debieron traer de otros lugares, a varios kilómetros de distancia.

El lugar, el yacimiento Dikika, está **a unos 200 metros** del lugar en el que hace una década se descubrió a la conocida como la '**hija de Lucy**', el esqueleto de esta misma especie de una niña de unos tres años, datada hace 3,3 millones de años.

Son varios los enigmas que se abren con el hallazgo. Hasta ahora la utilización de herramientas de piedra con filo y el consumo de carne de grandes animales se consideraban propios del género humano. Además, se ha relacionado siempre este consumo de carne con **el aumento del tamaño del cerebro**, algo que, según parece, tardó un millón de años en producirse.

McPherron tiene intención de regresar a Etiopía para buscar el lugar donde los Australopithecus encontraron las piedras y comprobar si eran capaces de fabricarlas.