

Lucy's fame endures beyond scientific value

By ERIC BERGER, Houston Chronicle

Aug. 29, 2007

Humans aren't bigger or stronger than other species. We're smarter. So it stands to reason that bigger brains were the defining characteristic that set humans apart from apes.

Right?

Wrong. Lucy, the world-famous fossil who will go on exhibit in Houston on Friday, walked upright but had a small head.

This bipedalism-before-brains discovery is just one of the evocative mysteries both answered and raised by Lucy, the 3.2-million-year-old member of the *Australopithecus afarensis* species who will be displayed publicly for the first time outside Ethiopia at the Houston Museum of Natural Science.

At the time of her 1974 discovery in Ethiopia's Afar region by Don Johanson and his student Tom Gray, Lucy was hailed as the oldest member of the constellation of ape-like ancestors that led to modern humans.

She has since lost her title as the oldest known hominid. But her fame endures. "I am a bit surprised about the ever-expanding popularity of Lucy, especially in light of so many other notable hominid fossil discoveries in Africa," said Johanson, director of the Institute of Human Origins at Arizona State University. "Yet Lucy continues to prevail, and she has become an icon for human evolution and is the touchstone by which all other finds are judged. I suppose one of the distinctive things about Lucy is that she has a name, one that is easy to remember, certainly easier than *Australopithecus afarensis*."

Before Lucy, many paleoanthropologists — the scientists who sort out the many-branched tree of human origins — believed the first real humanlike attribute to emerge among apes was a larger brain size.

Lucy — who stood 3 feet, 8 inches tall, clearly walked upright and had a small cranium — quashed that argument. Johanson and Gray recovered 40 percent of her bones. With the aid of the aged skeleton, scientists for the first time could place strong legs, shortening arms no longer used for walking and a small brain cavity side-by-side.

"With Lucy, you get the best possible combination of oldest and most well-preserved fossil," said Dirk Van Tuerenhout curator of anthropology for the Houston museum.

In almost every way aside from walking upright, Lucy was unlike modern humans. Her small body size was comparable to that of a chimpanzee. She did a fair amount of tree climbing, and her diet included little meat, consisting primarily of fruits and nuts.

And she was constantly threatened by predators.

"These guys were at the bottom of the food chain," said John Hawks, an assistant professor of anthropology at the University of Wisconsin-Madison. "They often died by the water. Crocodiles would crawl out and rip them apart. Lions ate them. The average age of death for these hominids is about 14 years."

At 3.2 million years old, Lucy and her species now represent something of a midpoint in the evolutionary timeline of humans, which began 5 million to 7 million years ago when chimpanzees — humanity's closest living relative — and *Homo sapiens* last shared an ancestor in Africa.

Since Lucy's discovery, there have been older hominid finds.

Among the oldest possible human ancestors are *Sahelanthropus tchadensis* (which lived 6 million to 7 million years ago) and *Orrorin tugenensis* (6 million years ago). But it's not clear that these really were hominids or if they truly walked upright. As such, they remain controversial, and the first link in the human chain likely remains undiscovered.

Among the earliest human ancestors, most experts agree, is *Ardipithecus*, a genus that lived 4.4 million to 6 million years ago. Then comes *Australopithecus*, of which Lucy is a member. That genus lived 1.2 million to 4 million years ago and is believed to be the first to fundamentally walk upright.

A gap exists in the fossil record between *Australopithecus* and the *Homo* genus, which emerged about 2 million years ago and eventually led to *Homo sapiens*. Scientists do not yet know which *Australopithecine* species directly led to humans. Perhaps it was Lucy. Or perhaps she was just an aunt on humanity's complex and still-clouded family tree.

Modern humans appeared on the scene about 200,000 years ago and originated in Africa.

"It's clear that researchers have been able to fill in the broad outline of the human story in recent years," said Ann Gibbons, author of *The First Human*. "There's agreement on the big picture — where we arose and roughly when. But they disagree on the details and need data in the form of new fossils to answer crucial questions."

Embedded within scientific efforts to elucidate the forked path from apes to humans are myriad questions beyond the reason why early humans took up bipedalism. Why, for instance, did they start using tools? What led to language?

Scientists recently added another potent weapon in their efforts to triangulate the story of human origins — genetics. Each of the 25,000 genes in the human body has a story to tell, and the function and age of each gene offers clues to human development. About five years ago, geneticists found a gene associated with language they called *FOXP2*. People who have a mutation of this gene can't speak correctly, and chimpanzees don't possess the gene. Genetic analysis suggests humans developed the gene about 200,000 years ago.

By overlaying this genetic evidence with throat bone fossils, paleoanthropologists have come closer to determining which species developed the capacity of complex speech and when they did it.

"We're finding out so much more every year that this is an entirely different field than it was even five or ten years ago," Hawks said.

The field is also growing in numbers, thanks in large part to Lucy's iconic status, which has accelerated the pace of fossil discovery.

"Lucy has given so much to paleoanthropology," said Johanson, who will lecture on the fossil at the Houston museum in November. "She has inspired literally thousands of students worldwide to become involved in the search for human origins."