



A fossilized skeleton was discovered in Chad in 2001. Researchers have raised questions about its femur (long bone, centre right).

## PALEOANTHROPOLOGY

# Femur findings remain a secret

*Fresh take on human ancestry struggles to be accepted.*

BY EWEN CALLAWAY

When anthropologists meet in France at the end of January, one of the most provocative fossils in the study of human evolution will not feature on the agenda. The approximately 7-million-year-old femur<sup>1</sup> was examined more than a decade ago by scientists in the French city of Poitiers, but has yet to be thoroughly described in a published scientific paper.

The fossil may belong to the earliest known hominin, the group that includes humans and their extinct relatives. Few people have had access to it, but two scientists who analysed the bone briefly in 2004 have prepared a preliminary description of it. They had hoped to present their analysis at the meeting, which is organized by the Anthropological Society of Paris and takes place in Poitiers. But the proposal by Roberto Macchiarelli, a palaeoanthropologist at the University of Poitiers, and Aude

Bergeret, director of the Museum of Natural History Victor-Brun in Montauban, France, was rejected by the conference organizers.

“This specimen is really important. It’s critical,” says Macchiarelli, who has shared his unpublished report with *Nature*’s news team. The femur probably belongs to a species called *Sahelanthropus tchadensis*, he says. The bone is important because it could settle whether the species is the earliest hominin yet found, as its discoverers have claimed after analysing the skull<sup>2</sup>. “This is a fantastic occasion to finally tell people what we have, and what we know about this specimen.”

The Anthropological Society of Paris told *Nature* that it had rejected 6 out of 65 abstracts. It said: “This work is conducted by an independent and impartial scientific committee, which is sovereign in its decision. Hence, any accusation about this would not be founded.”

The *Sahelanthropus* femur was discovered early on the morning of 19 July 2001, beside a battered skull and other bones at a site in the Djurab Desert in northern Chad, says Alain ▶



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► Beauvilain, a retired geographer who led the field team that made the discovery.

Michel Brunet, a palaeontologist at the University of Poitiers, who headed the Chadian expedition that discovered the *Sahelanthropus* remains, argues that the species is the earliest known representative of the hominin lineage.

His team described the skull — dubbed Toumaï, which means ‘hope of life’ in the Chadian Daza language — in a 2002 *Nature* paper<sup>2</sup> that became a scientific blockbuster. A subsequent analysis of the skull and other fragments by Brunet and his team suggests that Toumaï probably walked upright on two legs<sup>3</sup>. Brunet declined to comment on the analysis of the thigh bone or on Macchiarelli’s and Bergeret’s efforts to describe it at the Poitiers meeting. “Our studies are still in progress,” he wrote in an e-mail. “Nothing to say before publishing.”

Other researchers have questioned whether Toumaï was indeed part of the lineage that led to humans, pointing to recently discovered fossils from Ethiopia and Kenya as better contenders for the earliest hominin. But Brunet’s team has stood by Toumaï’s hominin status in response to the controversy<sup>4</sup> and in a subsequent publication that described a lower jaw and teeth<sup>3</sup>.

Beauvilain says that the femur and other material remained in Chad until they were eventually shipped to Poitiers in 2003, where they were stored in a collection of animal-bone

fragments from the trip. In 2004, Bergeret, who was then a graduate student at the University of Poitiers, came across the blackened and badly damaged bone while analysing other bones in the collection. “I discovered the femur by chance,” she says.

#### EXCITING FIND

Brunet and other members of his team were back in Chad when Bergeret found the femur. So she asked Macchiarelli, who studies human evolution and who was then head of the department of geosciences at the University

**“This is a fantastic occasion to finally tell people what we have, and what we know.”**

of Poitiers, for help in analysing it. She says that she examined it closely for several days, comparing it to other hominin fossils. “I remember joking with another student, who told me, ‘You found Toumaï’s femur!’” Bergeret says. “I realized when I saw Roberto Macchiarelli that this joke was probably based on reality.”

In their short description of the femur, Macchiarelli and Bergeret contend that the bone differs greatly from that of a roughly 6-million-year old potential hominin found in Kenya in 2000 that is thought to have walked on two feet. Macchiarelli doubts that *Sahelanthropus*

is a hominin, but thinks a conclusion should be made only after more careful study of all its remains, including the femur.

The femur and other *Sahelanthropus* remains are crucial to determining the status of the species, because individual anatomical parts can often be misleading about evolutionary history, says Bernard Wood, a palaeoanthropologist at George Washington University in Washington DC. He says the fossil could belong to a now-extinct lineage of great ape.

A paper describing the femur is “long overdue”, says palaeoanthropologist Bill Jungers, at Stony Brook University in New York. “We don’t know why it’s been kept secret. Maybe it’s not even a hominin. Who the hell knows until someone can expose it.” ■

1. Lebatard, A.-E. et al. *Proc. Natl Acad. Sci. USA* **105**, 3226–3231 (2008).
2. Brunet, M. et al. *Nature* **418**, 145–151 (2002).
3. Zollikofer, C. P. E. et al. *Nature* **434**, 755–759 (2005).
4. Brunet, M. *Nature* **419**, 582 (2002).

#### CORRECTION

The Editorial ‘Vaccine boosters’ (*Nature* **553**, 259–250; 2018) said that the HIV-infected blood transfusions were given in the early 1990s. In fact, they were given in the 1980s.