

By Bobby Oerzen

# The Descendants

## Is a newfound prehistoric species our direct ancestor?



Matthew Berger wasn't looking to revise the story of human origins. He was just chasing his dog

Tau. But one day in August 2008, the 9-year-old boy stumbled upon a 1.9 million-year-old collarbone at a South African dig site. His discovery has sparked a new debate into the ancestry of human beings.

Matthew's father is Lee Berger, a paleoanthropologist—someone who studies the origins and the predecessors of the human species. Since 2008, Berger and his colleagues have been excavating the site where Matthew made his discovery. They've dug up a big collection of well-preserved bones, including a skull, a pelvis, a hand, and an ankle, that came from two individuals. One was an adult female, the other a juvenile male (around 10 to 13 years old). Likely

those of a mother and her son, the fossil remains are of *hominids*. Hominids are humans and the extinct humanlike creatures from which we developed.

Berger believes the hominid fossils his team found are those of a newfound species, one he calls *Australopithecus sediba*. The word *sediba* means "wellspring" in Sotho, an African language. *A. sediba*, says Berger, could be a direct ancestor of humans—the wellspring of our lineage.

### ALL IN THE FAMILY

The term *Australopithecus* refers to a *genus* (group of related species) that appeared in Africa between 5 million and 10 million years ago. Also called *australopithecines*, they had large apelike faces with big teeth. Their bodies were light, roughly 32 kilograms (70 pounds), and relatively short, about 1.2 meters (4 feet) tall.

Current evidence indicates as many as six known species of australopithecine lived before—and during—the time of *A. sediba*. Like most primates, australopithecines were well adapted to climbing trees. Unlike most primates, however, they were also *bipedal*, able to walk upright on two feet.

Bipedal locomotion became more efficient later as the australopithecines evolved into a new genus whose species had smaller faces and larger brains—the genus *Homo*. The first known *Homo* species—*H. habilis*—was named for the stone tools it apparently made. *H. habilis* had a very precise handgrip and short finger length—features that support the idea of toolmaking among the species.

As other species of the *Homo* genus evolved, their brains became larger and more complex. Modern humans (*H. sapiens*) have the most advanced and complex brains of all.



Above: Photographers surround Lee Berger, his son Matthew, and the bones of *A. sediba* that father and son found.

To Berger, *A. sediba* represents the species that connects the two groups *Australopithecus* and *Homo*. The *A. sediba* fossils contain "mosaic" features, he says, combining traits from both groups. *A. sediba* was adapted in its upper body to climbing trees, but its hands were hauntingly modern—those of a toolmaker. And its brain, though small, was strikingly human in structure.

"The many advanced features found in the brain and body make it possibly the best candidate ancestor for our genus *Homo*," he says.

The main problem with Berger's theory is timing. *H. habilis* appeared 2.5 million years ago. How could it have descended from an *A. sediba*, which lived half a million years in the future? That would be like a daughter giving birth to her mother.

Berger isn't dissuaded by that criticism. He believes that the fragmentary fossils that belong to the early members of the *Homo* genus might have been dated incorrectly. They might have come from individuals that lived after *A. sediba* and were actually its descendants.

### DEAD END?

Critics do agree that *A. sediba* is a new species but believe it became extinct without evolving into another species. That type of extinction is common in evolution, says Ian Tattersall, a paleoanthropologist at the American Museum of Natural History in New York City.



A skull (top) and other bones (below) from two partial skeletons of the newfound species, *A. sediba*, discovered in South Africa

"Nature's way of experimenting is by throwing different species into the ecological arena," he explains. "The better-adapted species survive, while the others go extinct."

Indeed, two or three early *Homo* species might have lived side by side 1.9 million years ago in Africa. It's possible that *A. sediba* lived among those species.

"[Evolution is] not a linear process," says Tattersall, explaining that one species doesn't necessarily give way to another and another. There are many "evolutionary dead ends"—species that simply die out.

Even if *A. sediba* is one of those dead ends, Tattersall maintains, "it gives us a better picture of what hominids looked like at the time."

### ARTICULATE BONES

The *A. sediba* fossils that Berger's team found are amazingly well preserved and *articulated*—some of the bones were found still fused together. Typically, with fossils that old, only bone fragments remain. With the *A. sediba* fossils, however, "the most astonishing thing is the completeness," says Tattersall about the articulated remains.

Although Tattersall calls the mosaic features of *A. sediba* "incredible," he is less sure than Berger that *A. sediba* is a linear ancestor of *H. sapiens*. Nevertheless, the fossils tell us a lot about our evolutionary past, he says. The "mix-and-match" mosaic features show how nature experiments.

Whether or not humans are descended from *A. sediba*, our ancestors underwent the same *selection pressures*—the conditions that force a species to continue adapting to survive. "And out of this evolutionary ferment," Tattersall says, a tinge of excitement in his voice, "our genus *Homo* arose." **CS**

**Family Tree** Prehuman evolution has wound its way through two *genera* (groups of related species) during the past 4 million years. The first genus, *Australopithecus*, existed roughly 4 million to 2 million years ago. The second genus, *Homo*, existed after that. Species in the second group had bigger brains and longer legs and used tools. Humans (*Homo sapiens*) are the only surviving species in that group. Scientists are trying to determine the exact connections between all the species in each genus to find out which ones became extinct and which ones evolved into later ones that finally became humans. Listed at right are many of the known species in each genus.

