Hall of fame. Lee Berger showed off casts of *Au. sediba*'s bones in the hallway at the meeting.

A New Ancestor for *Homo*?

Finding one partial skeleton of an ancient member of the human family is the rarest of rare discoveries in human evolution. So paleoanthropologists in the audience murmured in surprise when South African researchers announced at a talk that they had found bones and teeth from at least four individuals of a new species of early human, *Australopithecus sediba*. The discoverers say this species shows some surprisingly modern traits and may even be an ancestor of our own genus. "We really have found something very, very odd and very unexpected," says discovery team leader Lee Berger of the University of the Witwatersrand, Johannesburg, in South Africa. But other paleoanthropologists are waiting for more detailed analyses of the unpublished fossils before they agree on its identity or place in the human family tree.

New face. The skull of *Au. sediba* shows some surprisingly modern features.

The four hominin individuals died when they fell into a "death trap" in a cave at Malapa, South Africa, 1.977 million years ago, according to new dates reported by Darryl de Ruiter of Texas A&M University in College Station in his talk. In addition to the articulated partial skeletons of a youth and an older female unveiled last year (*Science*, 9 April 2010, p. 154), the team members also reported the discovery of an 18-month-old infant and at least one other adult. This means they are getting a good look at *Au. sediba*'s development from infancy to old age.

In five separate talks, Berger and members of his team sketched a quick portrait of *Au. sediba*, who lived at the mysterious time right after the emergence of our genus, *Homo*, between 2 million and 3 million years ago. Researchers have long wondered which of several species of *Australopithecus* gave rise to *Homo*, with Lucy's species, *Au. afarensis*, as the leading candidate.

The trove of well-preserved bones includes clavicles, shoulder blades, and ribs as well as a largely complete skull, hand, foot, and two pelvises. The team calls the hominin an australopithecine because it had a small brain and "overall body plan" like that of an australopithecine, team member de Ruiter said in his talk.

But the fossils also show some surprisingly modern traits usually found only in members of our genus, Berger said. The two pelvises, in particular, are capacious and elongated, resembling those of *Homo*. In his talk, Berger ticked off a list of other modern traits, including smaller teeth, short hands, and an elongated thumb. In a separate talk at the annual meeting of the Paleoanthropology Society, Kristian Carlson of Indiana University in Bloomington described the endocast—the impression left inside the skull by the brain—and suggested that the forebrain might be reorganized in a modern way. If so, *Au. sediba*'s brain and pelvis both would have begun to evolve into more modern shapes before the brain expanded, countering the view that a big brain drove the evolutionary remodeling of the pelvis and brain.

Members of our genus were already living when these hominins fell into the pit at Malapa, so these particular individuals aren't our ancestors. But de Ruiter said they might be late members of a species that previously gave rise to *Homo*, or a close relative.

Other researchers, who examined casts of the fossils at the meeting, agreed that on first glance they represent an unusual mix of primitive and more modern traits. But most thought it important to compare *Au. sediba* directly with other ancient hominins in more detail. "The pelvis does look more modern," says paleoanthropologist Christopher Ruff of Johns Hopkins University in Baltimore, Maryland. "But that doesn't mean it looks exactly like a modern human's or that it gave rise to early *Homo*."

Even if *Au. sediba* is an evolutionary dead end, says William Kimbel of Arizona State University, Tempe, "it does still shed light on the evolution of early *Homo*, because we know nothing about the time period a half-million to three-quarter million years before *Au. sediba*."

Ancient Footprints Tell Tales of Travel

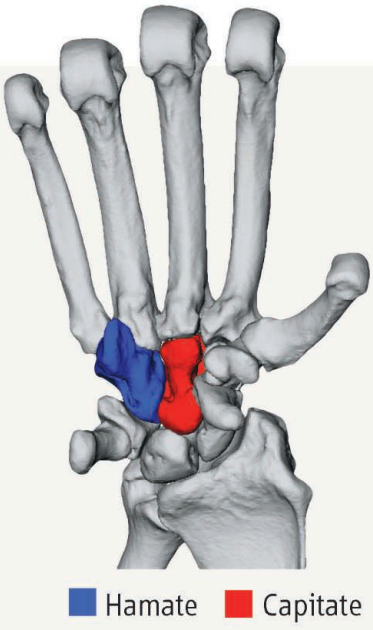
About 120,000 years ago, some three dozen men, women, and children stepped across wet volcanic ash on the ancient shores of Lake Natron in Tanzania. By scrutinizing their well-preserved trail, researchers have gotten their first snapshot of what a traveling group of archaic humans looked like, down to the size of the group and the ratio of men to women with children, according to paleoanthropologist Brian Richmond of George Washington University in Washington, D.C. "What's really exciting is we're getting a glimpse of actual behavior preserved in the

Snapshots From the Meeting >>

Finding *Homo*'s hips. What are the odds that fossil hunters would find a piece of a thighbone that fit perfectly on top of a broken bone found 29 years earlier? This is precisely what happened in 2009 at Koobi Fora on the east side of Lake Turkana in Kenya, where the famed Leakey family's teams have worked for decades: Researchers from the Koobi Fora Research Project fit the top of a newly found femur onto the shaft of the same individual's thighbone, which had been found back in 1980. In a talk, paleoanthropologist Carol Ward of the University of Missouri, Columbia, described the new thighbone and a pelvis found with it, which belonged to an early member of our genus that lived 1.88 million years ago.

The head of the femur is big and its neck is broad, and those features, plus others in the pelvis, reveal the fossil's owner as a member of *Homo*. But the shape of the femoral shaft shows it is not a member of ***H. erectus***, a species known from Koobi Fora at this time. Finds of skulls and teeth had suggested that as many as three *Homo* species—*H. erectus*, *H. habilis*, and *H. rudolfensis*—coexisted at Koobi Fora from 1.8 million to 2 million years ago, but this is the first convincing evidence that those different *Homo* species had different postcranial morphology. "This gets us thinking about the diversity of creatures running around Koobi Fora nearly 2 million years ago," Ward says.

All in the wrist. Three new wrist bones from a second individual of the diminutive "Hobbit" from the Indonesian island of Flores confirm that the hand was too primitive to belong to a member of our species, *Homo sapiens*, according to a poster by paleoanthropologist Caley Orr of Stony Brook University in New York and his colleagues.



The other hand. These bones in the hobbit's wrist (drawn onto a chimpanzee hand) are different from those of modern humans.

They described three wrist bones found by Matthew Tocheri of the Smithsonian National Museum of Natural History among the unidentified bone remains of the hobbit, *H. floresiensis*; all the bones were discovered in Liang Bua cave on Flores. The wrist bones are smaller than those from the first *H. floresiensis* individual, but they show a nearly identical pattern of unusual three-dimensional shape (*Science*, 21 September 2007, p. 1743). Both hands lacked features in a complex of bones, including the hamate and capitate, that mesh together to absorb stress in the hands of modern humans and Neandertals. This suggests that the hand bones of *H. floresiensis* did not distribute force away from the base of the thumb and across the wrist as efficiently as in modern humans.

Having the same features in two individuals' wrists makes it highly unlikely that their unusual shape was caused by disease in a modern human, as some researchers have claimed. "This is normal anatomy for *H. floresiensis*," Orr says. "It's consistent with the hypothesis that this is a distinct species." **–A.G.**

fossil record," he said in his talk.

The local Maasai people have long known about the trail of footprints at Engare Sero on the southern shore of Lake Natron, in the shadow of Oldoinyo Lengai volcano, which is still active. But researchers didn't learn about the footprints—which are incredibly rare in the fossil record—until 2008. Since then, Richmond, geologist Cynthia Liutkus of Appalachian State University in Boone, North Carolina, and their colleagues have uncovered 350 tracks made by anatomically modern humans (as shown by their arched feet), over an area of 150 square meters. They noticed immediately that there are two sets of trails headed in opposite directions: one toward the northeast and another to the southwest. Preliminary radiometric dating on the volcanic ash below the prints puts them at about 120,000 years old. Because the footprints were made in wet ash, they must have been made in a matter of hours or days by "people living in a landscape at one place at one time," Richmond said in his talk.

By scanning the footprints using photogrammetry, the researchers reconstructed a three-dimensional image of the site and used this image to measure precisely the length of each of the feet, which ranged from 14 to 29 centimeters. By counting how many different foot lengths were there, they estimated that more than 30 individuals laid down the tracks. Then they compared a couple of dozen of the foot lengths with those of more than 2000 African Americans to estimate the age and sex of each individual. They found, for example, that a large group of more than a dozen women and children with only one clearly identifiable adult male walked together from northeast to southwest. But the tracks that headed in the opposite direction (southwest to northeast) were made by several individuals who were not traveling together, and there were more males. The tracks fit a scenario like this: A few men, women, and adolescents traveled in one direction. A short time later, a group of women and children and a man walked as a group in the opposite direction.

Fancy footwork. Footprints in Tanzania reveal ancient travelers' behavior.

To test that idea, Richmond and his colleagues ran experiments examining the footprints left by local people who seldom wear shoes, as they walked and ran at various speeds. They concluded that people in the large group were all walking at the same speed, as if they all were adjusting their speed to travel together. But the people heading in the opposite direction were moving at different speeds, ranging from walking to running, suggesting that they were not moving together. The footprints provide "an extraordinary vignette of a moment in the lives of our ancestors," says paleoanthropologist Ian Tattersall of the American Museum of Natural History in New York City. And the prints freeze behavior. "Fossil bones have dominated interpretations of hominin locomotion," says paleoanthropologist Richard Potts of the Smithsonian National Museum of Natural History in Washington, D.C. "Now footprints are beginning to offer the real imprint of behavior." **–ANN GIBBONS**

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