PALEOANTHROPOLOGY

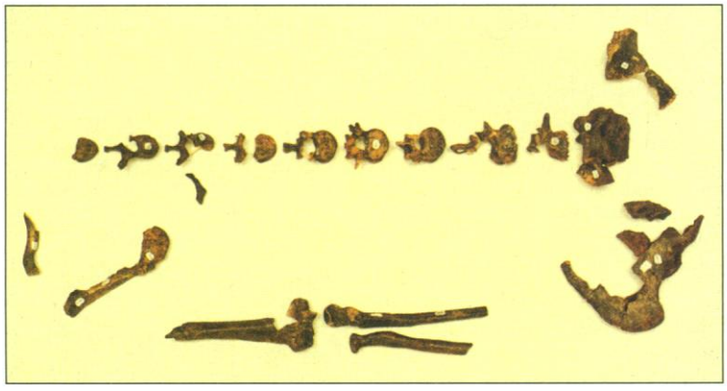
New Skeleton Gives Path From Trees to Ground an Odd Turn

It has been three-quarters of a century since a young anatomist named Raymond Dart reached into a box of rocks and pulled out a missing link. The carton, sent to him from a quarry near Johannesburg, South Africa, contained the limestone-encrusted skull belonging to a "man-ape" species that lived from 2.6 million to 3 million years ago, which Dart named *Australopithecus africanus*. It was the original australopithecine. In recent years, *africanus*'s part in most scenarios of early human evolution has been overshadowed by abundant finds of other hominid species from the Great Rift Valley in East Africa. Now, however, *africanus* is emerging from its box once again—this time, placing a kink instead of a link into our lineage's passage from "ape" to "man."

Hundreds of *africanus* specimens—many of them "kept on the back burner" by the boycott against South Africa's old apartheid government, according to Phillip Tobias of the University of Witwatersrand—are just now coming under scrutiny. One of them is the most complete australopithecine skeleton found since "Lucy," a 3.2-million-year-old representative of an *africanus* predecessor, *Australopithecus afarensis*, giving researchers an unprecedented chance for comparisons. What they've found, according to a presentation at the annual meeting of the American Association of Physical Anthropologists 3 weeks ago in Durham, North Carolina, is that the body proportions of *africanus* were actually more apelike—and perhaps more suited to a life in the trees—than those of *afarensis*, its presumed ancestor.

Combined with an analysis of dozens of other *africanus* bones, says study co-author Henry McHenry of the University of California, Davis, the skeleton suggests that the path from the apes, toward humanlike body proportions—shortened arms and longer legs—and the terrestrial way of life that went with them, was not at all straightforward. It may have included a temporary return to a lifestyle that included more tree-time. "This is very interesting work," says Bill Jungers of the State University of New York, Stony Brook. "It's been said before that bipedalism does not preclude arboreality. And boy, here it is again." More radically, McHenry's coauthor, Lee Berger of the University of Witwatersrand, says the results may shunt *afarensis*, long ensconced near the root of our family tree, off to the side as an early experiment in humanlike bipedalism that went nowhere. Our main lineage went through more apelike *africanus* and didn't become fully bipedal until later.

Both these interpretations rest on *africanus*'s long-held position as the immediate predecessor to our own genus *Homo* and successor to older species such as *afarensis*. It has several characteristics, such as an expanded brain, a less projecting muzzle, and smaller canines, that make it a morphological intermediate. But bones below the neck have been rare, so *africanus*'s locomotor adaptations have been largely inferred.



P. TOBIAS

Back to the trees? This partial skeleton of *Australopithecus africanus* indicates this human ancestor may have spent more tree-time than its own, fully bipedal, forerunners.

The new material, from a cave known as Sterkfontein, fills in some holes. McHenry and Berger were able to compare more than 70 upper and lower limb bones from the site, including those of the partial skeleton, Sterkfontein 431, to Lucy and other well-known *afarensis* fossils from Hadar in Ethiopia. Previously, McHenry had developed a formula for estimating human body weights from limb joint sizes. When he and Berger applied the formula to both upper and lower limb joints from *afarensis* specimens, Lucy's species turned out to be proportioned pretty much like a modern human. But the results of a comparison of the new Sterkfontein limbs, upper and lower, were "nothing less than astounding," according to Berger. The proportions calculated for *africanus* turned out to be amazingly close to those of a chimpanzee, with big arms and small legs. In this respect, Dart's "man-ape" appears to have been much closer to ape than to man.

Although *africanus*, with a humanlike pelvis built for bipedality, could certainly stride on the ground, its primitive body proportions suggest that it might have been spending more time in the branches than did its presumed ancestors. That picture is also gaining support from paleoenvironmental studies—based on fossil pollen and fauna—showing that Sterkfontein and other South African sites may have been more wooded than scientists had previously thought.

If *africanus* was indeed more primitive than *afarensis* in its body proportions, another type of tree—the one that depicts hominid family relationships—may need revising. The most radical revision would put *afarensis* on another branch, as an early, separate experiment in fully terrestrial bipedalism that shared a common ancestor with *africanus*, but eventually went extinct. The other branch, meanwhile, gave rise to *africanus*, which only gradually shed its apelike proportions as the African landscape opened up 2.5 million years ago, and eventually evolved into *Homo*. Berger notes that the only two known partial skeletons of *Homo habilis*, the earliest member of our genus, also have more apelike body proportions. "One might say we are kicking Lucy out of the family tree," says Berger.

Few other investigators, including McHenry, would care to go that far. McHenry says it's more likely that the hominid lineage leading to *Homo* descended from *afarensis* by way of *africanus*, but underwent an evolutionary reversal in *africanus* toward less humanlike body proportions, perhaps triggered by a change in the environment, and the hominids later reacquired a more modern form.

Still other scenarios may soon be in play, because the new lode of bones from Sterkfontein is just beginning to have an impact on theories of early human adaptation and evolution. Combined with the entry of two wholly new species into the fray recently—*A. anamensis* and the 4.4-million-year-old, achingly enigmatic *Ardipithecus ramidus* from Ethiopia—one thing seems certain: The human lineage, with its diverse twists, turns, branchings, and doubling-backs, was anything but linear. As McHenry puts it, "There was more than one way to be a hominid."

–James Shreeve

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