

## PALEOANTHROPOLOGY

## Human Ancestor Caught in the Midst of a Makeover

ALBUQUERQUE, NEW MEXICO—Renowned paleoartist John Gurche prides himself on his accurate reconstructions of early humans. But last week, the famed human ancestor *Homo erectus* was giving him trouble. Gurche immortalized a female *H. erectus* in bronze for an exhibit that opened this month at the Smithsonian Institution's National Museum of Natural History, so he watched with some trepidation as the species got a new look at the annual meeting of the American Association of Physical Anthropologists here. Several talks and posters reported how new discoveries and analytical methods are altering views of this species, from the way it looked to how it grew up and gave birth. "This gives you a good idea how much our view of *H. erectus* is in flux," said Gurche.

By the time researchers were done, some early members of *H. erectus* had morphed from tall, slender-hipped individuals that looked a lot like us into shorter, broader hominins. "*Homo erectus* continues to evolve," says paleoanthropologist Scott Simpson of Case Western Reserve University in Cleveland, Ohio.

One individual—the rare partial skeleton of the Nariokotome Boy—has dominated views of *H. erectus* for nearly 2 decades. This adolescent died 1.6 million years ago near Lake Turkana in Kenya where he was discovered in 1984. Researchers thought this boy grew at the same rate as modern humans and initially calculated that he was about 11 to 12 years old when he died. If he had undergone an adolescent growth spurt, as we do, he would have reached a strapping 188 centimeters and 68 kilograms as an adult. Because there were no other complete pelvises of early *Homo*, researchers also used modern human proportions to put together the boy's pelvis. So it came out quite narrow, like ours, says paleoanthropologist Christopher Ruff of Johns Hopkins University in Baltimore, Maryland, who helped do the reconstructions.

This view of a lanky youth who looked modern from the neck down—there's no doubt that *H. erectus*'s brain was much smaller than ours—spurred many interpretations of the species's biology. For example, researchers suggested that its height was an adaptation to stay cool and to run efficiently in the hot tropical climate. The slender hips also gave the boy's female brethren a narrow birth canal, implying that newborns had small brains and were helpless at birth.

*H. erectus* has been brought down to size

lately, though, as researchers have found several smaller individuals, including some outside Africa (*Science*, 21 September 2007, p. 1664); many suspect the species may have had more sexual dimorphism than had been thought, because *H. erectus* now appears in both short and tall sizes, based on long bones. New dental methods also predict that *H. erectus* grew faster than we do, at a rate closer to a chimpanzee's than to ours. Using intermediate growth rates, graduate student Ronda Graves of Stony Brook University in New York state calculated that Nariokotome Boy would have had less time than originally predicted to reach his adult height when he died. She estimated at the meeting that he would have reached 163 cm in height and 56 kg in weight as an adult—"shorter and wider" than previously thought.

Just how much wider was illustrated in another team's reconstructions of the boy's pelvis, also unveiled at the meeting. Simpson and Linda Spurlock of the Cleveland Museum of Natural History realigned the pieces of Nariokotome Boy's pelvis, guided by a female *H. erectus* pelvis from Gona, Ethiopia, that Simpson reported 2 years ago (*Science*, 14 November 2008, p. 1089). They found that the widest measure from side to side on the boy's pelvis is 255 to 260 millimeters rather than 225 to 230 mm. This would give the boy an adult hip breadth of 295 to 301 mm rather than the 266 mm originally proposed, and would match those of the short, wide-hipped female from Gona, whose pelvic breadth was 288 mm. "*H. erectus* was not simply a small-brained modern human," says Simpson.

Ruff agrees that the boy's height and pelvis need to be revised, but he thinks Graves and Simpson may have gone too far. Graves's numbers rely on "unrealistic" growth trajectories: Even if the boy grew as fast as a chimpanzee, he would have reached 175 cm and 75 kg as an adult, he says. Ruff also thinks Simpson relied too heavily on the Gona pelvis. That specimen was not found with other identifying bones, and it is so small-bodied that Ruff thinks it may have belonged to an australopithecine—a proposal that Simpson vigorously challenged in the question-and-answer period after Ruff's talk.



**How tall?** Reconstructions of *H. erectus*, like this female in bronze, are based in part on the Nariokotome Boy skeleton (inset).

If *H. erectus* was broad-beamed, the wider birth canals of females would allow their babies to be born in a more straightforward way than those of *H. sapiens*, which must rotate during birth so their heads can fit through a narrow birth canal, says paleoanthropologist Karen Rosenberg of the University of Delaware, Newark. That's "more reasonable," she says, and fits better with other extinct hominins.

The diverse meeting reports are just the most recent revisions to *H. erectus*, says Gurche, who could be found taking careful notes at every *H. erectus* talk. About 16 months ago, he was finishing up an *H. erectus* model when the wide-hipped Gona pelvis was published. So Gurche remodeled his statue to make the hips a centimeter wider. Four months later, he was putting the final touches on the cast when newly discovered footprints in Kenya suggested that *H. erectus* had shorter toes. "I had to chisel the toes," says Gurche. "We should lock these guys in a room together until they work *H. erectus* out."

—ANN GIBBONS