

Part of the curriculum:

Relationship between present and fossil organisms – Phylogeny – Evolution

Human ancestors walked comfortably upright 3.6 million years ago, new footprint study says

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A comparison of ancient and contemporary footprints reveals that our ancestors were strolling much like we do some 3.6 million years ago, a time when they were still quite comfortable spending time in trees, according to a study which will be published in the March 22 issue of the journal *PLoS ONE*.

Anatomical fossils have given insufficient confirmation about when our ancestors developed a fully modern gait*. Although some researchers have argued that the 4.4 million-year-old ancient human *Ardipithecus ramidus* ("Ardi") described in October 2009 was adept at walking on her hind legs, many disagree.

So rather than discussing over badly crushed—and often missing—fossil bones, the researchers behind the new study turned much of their focus back to the famous Laetoli footprints, which were discovered more than 30 years ago in what is now Tanzania. Likely left by *Australopithecus afarensis*, the same species as "Lucy," these prints show an upright gait*, but it has remained controversial just how fluid and modern this creature's walk would have been.

"Based on previous analyses of the skeletons of *Australopithecus afarensis*, we expected that the Laetoli footprints would resemble those of someone walking with a bent knee, bent hip gait typical of chimpanzees, and not the striding gait normally used by modern humans," David Raichlen, an assistant professor in the Department of Anthropology at the University of Arizona in Tucson and lead author on the study, said in a prepared statement.

To test this assertion, Raichlen and his colleagues created a sandy test bed for contemporary subjects to walk across—both normally and then in a bent, chimpanzee-like manner. The researchers used a laser scanner to construct 3-D models of all of the footprints to compare with the Laetoli tracks.

"To our surprise, the Laetoli footprints fall completely within the range of normal human footprints," Raichlen said. The upright, modern walkers' prints had heel and toe-print depths that were relatively equal, as the Laetoli prints do, but those locomoting more like chimpanzees—as ancient humans have been proposed to have done—produced toe prints that were much deeper and did not match the Laetoli patterns.

Gait* = way of walking

Sum up the criteria that make scientists place Australopithecines in the Human lineage and list those that allow us to think they had an upright gait.

Then explain the experiment and describe how australopithecines walked in Laetoli.

You may use the following key words:

Pelvis – limbs – toe-print depth