**Origins of Bipedalism**

Why do we walk on two legs? If you asked a roomful of anthropologists, you'd likely not get the same answer from any two of them. Specialists cite everything from changing landscapes to needing to keep cool to heightening sexual attraction as probable causes of our upright stance, generally agreeing only on one point: that everyone else's hypothesis is wrong. Below, sample leading hypotheses and vote for the one that you prefer. Then read paleoanthropologist Donald Johanson's take on all this.—*Rima Chaddha*

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| Hauling Food |    | **Hauling Food**As the African landscape shifted gradually from dense forests toward large patches of savannah, early hominids found their food supplies waning, leading them to descend from the trees and become ground-dwellers. Because these early human ancestors could no longer feed where they lived, they were forced to begin carrying large amounts of sustenance over long distances back to their home bases—a tricky task had they remained quadrupeds. While some anthropologists contend that early hominids gathered fruits and nuts, a few argue that they were scavengers, stealing predators' kills. An upright stance would have enabled our ancestors to lug carcasses to safer areas for consumption, while also allowing them to see other food sources or potential danger at greater distances.  |
| A New World |    | **A New World**Many anthropologists hypothesize that our ancestors developed an upright posture in order to carry food over long distances, but others believe they stood up merely to *find* it. As early hominids left the comfort of the forest to explore the savannah, they no longer needed a body structure suitable for climbing. Those who could walk upon two feet were better able to survive because they expended less energy and could travel longer distances than knuckle-walkers; they were also better able to see potential dangers lurking in the distance. Other anthropologists have suggested further environmental factors that might have helped urge our ancestors to stand upright, such as the cold and wet ground conditions that today lead chimpanzees to become temporary bipeds until they reach dry land. |
| Attracting Mates |    | **Attracting Mates**Anthropologist C. Owen Lovejoy stirred controversy in 1981 when he attributed sex—specifically males' desire to get more of it—as a direct reason for why we walk upright. According to Lovejoy's behavioral model, males who could walk bipedally freed their arms to carry more food than their quadruped counterparts could hold, thus making the knuckle-walkers seem far less appealing to females. In this model, the upright males were simply better breadwinners. Their ability to ration more food for females (who remained at the home base to care for the offspring) ensured that they were able to reproduce, thus leading to future generations of adept bipeds who in turn were able to pass on their own genes. |
| Grabbing a Bite |    | **Grabbing a Bite**Some anthropologists argue that early hominids could not have become ground-dwellers and bipeds in a single evolutionary step, as many hypotheses imply. Instead, they contend, the ability to walk upright was in part a serendipitous by-product of new feeding habits. As our ancestors descended from the trees to forage on the ground for low-hanging fruits and berries, they began to feed from a squatting position. Over time, physiological changes occurred in their upper bodies, backbones, and pelvic areas, causing their weight and centers of balance to shift to a lower point in the body. This gave the hominids a steadier stance as well as the ability to stand upright with greater ease than their quadruped cousins. When our ancestors developed the need to reach higher and stand, these new physical traits came in handy—just as evolving a long neck proved favorable for the giraffe. |
| Keeping Cool |    | **Keeping Cool**Walking on two feet did more than help early hominids conserve energy, as some hypotheses suggest—it also protected them from overheating. According to evolutionary biologist Peter Wheeler, early bipeds were generally exposed to less direct sunlight on the savannah than quadrupeds of the same size. In fact, when the sun shone directly overhead, the heat load upon a hominid on two feet would have been 60 percent less than that upon a knuckle-walker. Additionally, bipedalism raised hominids' bodies above the ground, enabling their skin to come in better contact with cooler and faster-moving breezes. This allowed for further heat dissipation through convection, and, says Wheeler, it meant that biped hominids needed to consume only about three pints of water per day, whereas quadrupeds needed five. |
| Aquatic Apes |    | **Aquatic Apes**Although most paleoanthropologists, despite their many differences, tend to agree that our ancestors became bipeds on dry land, a few suggest an alternate possibility. Aquatic Ape Theory, posed by marine biologist Alister Hardy in the 1930s, postulates that several human traits, from relatively minimal body hair to the ability to sweat moisture and salt, can be explained only through the idea that early hominids once lived in semi-aquatic environments. The hypothesis claims that our ancestors had to wade regularly through shallow lake- or riverside waters in order to reach shellfish, aquatic plants, and other potential food sources. With their heavy upper bodies, quadrupeds would have had a more difficult time adjusting to walking upright on the savannah than in buoyant water. |
| Weapons and Tools |    | **Weapons and Tools**Some of the oldest and most popular suggestions for why we developed into bipeds state that our upright posture relates directly to our need to use weapons and tools. While some researchers hypothesize that it was bipedalism that brought forth our ability to use these primitive devices, others believe the reverse—that the advent of tool and weapon use encouraged us to become bipedal. Charles Darwin, for one, felt that early hominids would have been "better able to defend themselves with stones or clubs, to attack their prey, or to otherwise obtain food" if they stood, walked, and ran erect, whereas quadrupeds of the same size would not have been able to exert the same force from a sitting or squatting position. |
|  |    | **One Expert's View**Learn which [hypothesis](http://www.pbs.org/wgbh/nova/allfours/bipe-johanson.html) Donald Johanson agrees with and why. |



We recommend you visit the [interactive version](http://www.pbs.org/wgbh/nova/allfours/bipe-flash.html), where you can vote for your favorite hypothesis. The text to the left is provided for printing purposes.

