



Lucy in the Sky

Serendipity is looking in a haystack for a needle and discovering a farmer's daughter.

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Had paleoanthropologist Donald Johanson not been drawn away from paperwork by a graduate student while exploring for fossils in Ethiopia in 1974—or if the pair had not decided to have one last look before returning at a thus far unfruitful gully, or if the sun had not been striking the ground at just the right angle—he likely would never have caught the glint of what turned out to be bone fragments from a skeleton later determined to be of a female of the species *Australopithecus afarensis*, a hominoid dating back 3.2 million years.

The partial skeleton was named ‘Lucy’ that evening by an intern on the team, after the Beatles’ song “Lucy in the Sky with Diamonds,” which was playing in the camp.

Curiously, in 2016, a group of scientists theorized that the arrangement and condition Lucy’s skeleton suggested that her demise may have been caused by injuries sustained in a fall, presumably out of a tall tree.

Our early hominoid ancestors had good reason to spend much of their time in the trees: Aside from furnishing food, trees provided protection from a menagerie of vicious predators, including leopards, bears, crocodiles, and even massive birds of prey. (The skull of another *Australopithecus* was later found in the nest of a giant bird.)

Once they descended from the trees more enduringly (and gracefully) than Lucy, however, her successors hit the ground running. It wasn’t long before Lucy’s descendants, *Homo habilis* (‘handyman’)—and later, *Homo erectus* (‘upright man’)—had spread throughout the whole of Africa and were migrating into Europe via the Middle East.

Our hypothetical parent species, dubbed *Homo antecessor* ('pioneer man') split away from its parent, *Homo heidelbergensis* ('Heidelberg man') more than a million years ago, giving rise about 600,000 years ago to two branches: one leading to the Neanderthals and Denisovans, and the other to early *Homo sapiens* ('wise human').

Many scientists mark the true emergence of *Homo sapiens* to about 200,000 years ago, as evidenced by fossils discovered in 1967 by Richard Leakey in Omo-Kibish, Ethiopia, not far north of Lucy's discovery.

In any case, by the time *Homo sapiens* reached Europe 40,000 to 60,000 years ago, Neanderthals had already been living there for hundreds of thousands of years. (The fossil record suggests there may have been as many as three separate waves of migrants, with only the final one managing to establish a permanent presence in Europe.)

The Neanderthals were not the only pre-human species to precede humans out of Africa: To the East were the mysterious Denisovans, and in S.E. Asia, the diminutive *Homo luzonensis* and *Homo floresiensis*. (Perhaps seeking to replicate the remarkable unexpected celebrity of 'Lucy' in the non-scientific community, *H. floresiensis* was immediately nicknamed 'Hobbit' by its discoverers—over the staunch objections, incidentally, of J.R.R. Tolkien's heirs.)

While there was undoubtedly much interbreeding between early *Homo sapiens* and the Neanderthals (the DNA of modern, non-African humans is about 2% Neanderthal in origin), there is evidence that all was not 'kumbayah' between the two groups.

Many fossils of both species exhibit strong evidence of intertribal warfare (crushed skulls, broken limbs) as well as, in a surprising number of cases, cannibalism.

(*Homo erectus* had long since mastered the controlled use of fire, and his predecessor, *Homo habilis*, was adept in the use of primitive stone—and probably bone—tools, which could also act as effective weapons.)

Whether such violence among our early ancestors was the result of starvation, warfare, or ritual practices is unknown, but it was generally sporadic and disorganized in nature—like the fictional apes in the 1968 film "2001: A Space Odyssey," whose famous opening scene, "The Dawn of Man," depicts an ecstatic ape suddenly discovering how to use a bone as a weapon.

Archaeological evidence suggests that organized warfare emerged only about 12,000 years ago with the establishment of more permanent settlements, necessitated by the introduction of large scale farming.

By the Bronze Age (c. 3300 BCE), early civilizations in Mesopotamia and North Africa had developed large armies, with sophisticated copper weapons, as well as formal leaders and chains of command.

In "2001," the hurled bone jumps cuts to an orbiting bomb, a not-so-subtle reminder that humanity's technological progress is a continuum born out of its violent origins. Indeed, war is not a modern invention, but an ancient, fundamental part of our humanity—or perhaps one should say, inhumanity.

In fact, considering that virtually every technological advancement in history has eventually been weaponized (often skipping the 'benevolent' stage altogether), it's hard not to conclude that *Homo sapiens* is an inherently—and perhaps irredeemably—aggressive and self-destructive species.

Which brings one back to pondering our old friend 'Lucy' falling out of her tree. The incident begs the age-old question: "Did she jump or was she pushed?" ■