

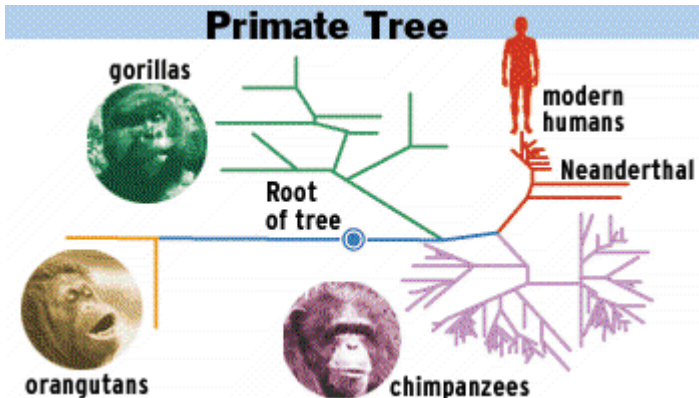
We Dodged Extinction

'Pruned' Family Tree Leaves Little Genetic Variety

Special to ABCNEWS.com

Just ONE group of chimpanzees can have more genetic diversity than all 6 billion humans on the planet.

A worldwide research program has come up with astonishing evidence that humans have come so close to extinction in the past that it's surprising we're here at all. Pascal Gagneux, an evolutionary biologist at the University of California at San Diego, and other members of a research team studied genetic variability among humans and our closest living relatives, the great apes of Africa. Humanoids are believed to have split off from chimpanzees about 5 million to 6 million years ago. With the passage of all that time, humans should have grown at least as genetically diverse as our "cousins." That turns out to be not true. "We actually found that one single group of 55 chimpanzees in west Africa has twice the genetic variability of all humans," Gagneux says. "In other words, chimps who live in the same little group on the Ivory Coast are genetically more different from each other than you are from any human anywhere on the planet."



The branch lengths illustrate the number of genetic differences, not only between species, but among species as well. The pruned bush for humans shows how little genetic diversity exists. (Marco Doelling/ABCNEWS.com)

The Family Bush

"The family tree shows that the human branch has been pruned," Gagneux says. "Our ancestors lost much of their original variability." "That makes perfectly good sense," says Bernard Wood, the Henry R. Luce Professor of Human Origins at George Washington University and an expert on human evolution. "The amount of genetic variation that has accumulated in humans is just nowhere near compatible with the age" of the species, Wood says. "That means you've got to come up with a hypothesis for an event that wiped out the vast majority of that variation." **The most plausible explanation, he adds, is that at least once in our past, something caused the human population to drop drastically.** When or how often that may have happened is anybody's guess. Possible culprits include disease, environmental disaster and conflict.

Almost Extinct

"The evidence would suggest that we came within a cigarette paper's thickness of becoming extinct," Wood says. Gagneux, who has spent the last 10 years studying chimpanzees in Africa, says the implications are profound. "If you have a big bag full of marbles of different colors, and you lose most of them, then you will probably end up with a small bag that won't have all the colors that you had in the big bag," he says. Similarly, if the size of the human population was severely reduced some time in the past, or several times, the "colors" that make up our genetic variability will also be reduced.

If that is indeed what happened, then we should be more like each other, genetically speaking, than the chimps and gorillas of Africa. And that's just what the research shows. "We all have this view in our minds that we [humans] started precariously as sort of an ape-like creature" and our numbers grew continuously, adds Wood. "We're so used to the population increasing inexorably over the past few hundred years that we think it has always been like that." But if it had, Gagneux notes, our genetic variability should be at least as great as that of apes.

A Stormy Past

Gagneux is the lead author of a report that appeared in the April 27 issue of the *Proceedings of the National Academy of Sciences*. The study, carried out with researchers in Germany, Switzerland and the United States, is the first to examine large numbers of all four ape species in Africa. "We can do that now because new technology allows us to non-invasively take some hair, or even some fruit that these apes chew, and then we get their DNA from a couple of cells that stick to a hair or a piece of fruit they chewed." Then they compared the DNA variability of apes and chimps to that of 1,070 DNA sequences collected by other researchers from humans around the world.

They also added the DNA from a bone of a Neanderthal in a German museum. The results, the researchers say, are very convincing. "We show that these taxa [or species] have very different amounts and patterns of genetic variation, with humans being the least variable," they state. Yet humans have prevailed, even though low genetic variability leaves us more susceptible to disease. "Humans, with what little variation they have, seem to maximize their genetic diversity," Gagneux says. "It's ironic," he notes, that after all these years the biggest threat to chimpanzees is human intrusion into their habitats. When he returned to Africa to study a group of chimps he had researched earlier, Gagneux found them gone. "They were dead," he says, "and I mean the whole population had disappeared in five years." Yet as our closest living relatives, chimps still have much to teach us about ourselves.

Lee Dye's column appears Wednesdays on ABCNEWS.com. A former science writer for the LA Times, he now lives in Alaska.

Note: Though we might disagree with the interpretation, this research fits perfectly the Bible story of God's judgement in Noah's Flood, and God's destruction of all flesh, except those in His Ark !!!