The Human-Chimpanzee Split

by Frank Dunne, MSPE

The Miocene epoch announced its arrival with the crash of continents thrusting the Alps and the Andes far into the sky. India was buckling the Asian Plate, bulldozing the Himalayas high up into the stratosphere. The Mediterranean Sea became a marshy plain, and the warm, wet forests of Africa were becoming windy savannahs. It was a warm epoch, yet there were extreme weather fluctuations. Mountain building and continental drift forced a change in the atmospheric circulation patterns, and the world began to cool and dry out. The climactic upheavals meant that animals and plants had to either adapt and diversify or die. The primates were no exception. So at the very start of the epoch, 23 million years ago, *proconsul* climbed down from a tamarind tree and introduced itself with a slight bow.[1]

Proconsul was an ape, a tail-less primate that probably ventured down to the ground often, but was more comfortable brachiating from branch to branch. This *hominin* is worth mentioning because it's probably the common ancestor of the gorillas, chimpanzees, and humans. It was evolved enough to earn a seat in the subfamily of the *order* Primates. The accolades don't stop there, though, because it's likely that several species spun off, or evolved, from this exceptional ape, and one of those was the proto-gorilla. As of yet, either no one has located the bones of the proto-gorilla, or no one is sure enough to make a definitive claim. Finding and deciphering the actual fossil bones of our largest cousin's forefather would be next to impossible; but all the same, it happened to be a particular species of *dryopithecine*.[2]

Drop a ceramic coffee mug onto the concrete ground or smash a glass marble with a hammer, and uncountable shards fly in all directions. This is what speciation is all about. Animals and plants of all kinds find isolated niches and develop unique survival attributes for their particular environments. Before long, taxonomic *Family* members evolve into a myriad of species. Locating the very species that Homo sapiens descended from, for example, would be impossible because no one will ever find all the biological shards that need to be examined. Instead, subtribe and larger taxonomic groups (the partially broken marble) can steer anthropologists in the right direction. Remember, it's the foundational developments in *posture* and *teeth* that separate the people from the non-people.[3]

Proconsul was the name of just one ape in the subfamily (some say tribe) known as the dryopithecines. These closely related taxa migrated into Europe, India, and even China, as well as remaining in Africa. Each population group found an environmental niche and slowly developed into distinct species. Almost all, eventually, became extinct. By good fortune, one type of dryopithecine, the proto-gorilla, survived, and that's the species that commands our attention. It eventually evolved from a dryopithecine into the modern gorillas. At some time definitely more than 13 million years ago, the proto-chimpanzee spun off the gorillas to become a separate tribe.[4]

It's important to keep in mind that humans and the great apes share the same direct lineage from proconsul, and because of this, the obvious conclusion, though an eye-opener, is that proto-humans evolved from chimpanzees. Of course, mainstream thinking insists that chimps and humans diverged from a common *Hominini* (tribe) ancestor that was neither *Panina* nor *Hominina* (subtribes) yet.

Maybe… but that generic reasoning raises questions, because all living organisms can be taxonomically defined down to species type. Any animal that was of the tribe Hominini was also included in a particular subtribe, genus, and species. This is true whether it was in the primeval past or the present. My contention is that chimpanzees already existed, and then Hominina evolved from that subtribe. As with all other genetic divergences, the split starts at the species level and works its way up. At the risk of belaboring the point, I think the divergence isn't as high as most people think. On the other hand, I think the divergence started much further back in time than most people think.

The search for the *Missing Link* between humans and chimpanzees has fascinated people for centuries, and it's doubtful that this fantasy will come to an end anytime soon. When we admit, grudgingly, that the first proto-humans evolved from the subtribe Chimpanzee, it's time to admit that the search is over. In other words, the last common ancestor of chimpanzees and humans was a chimpanzee.

A further elaboration of this idea can be seen in the human evolution which occurred after the split. Homo sapiens directly evolved from a particular population of Homo erectus, which directly evolved from a particular Australopithecus. There wasn't an involvement of transitional species. If we consider every micro-alteration as a new and different genus or species, then we would have to re-examine our definition of modern human variation and diversity.

But I've explained this too zealously, because the modern chimpanzee species, *Pan troglodytes*, is not likely to be the same species of millions of years ago, thanks to gene mutations. My own thinking is that the species of all organisms have a finite life span. Even if nothing in the environment changes, accumulated genetic mutations, caused by time, will eventually become so numerous that a new species will emerge from the old, genetically altered one. In this respect, a common transitional ancestor can be claimed for anything. However, this explains horseshoe-crab modifications, not human evolution. Human beings are the product of a population of chimpanzees that left the jungle to live everywhere else but in the jungle. Eventually, some humans returned to the jungles, but only after they were already genus Homo.

Looking beyond our anatomical similarities, such as both having Type O and Type A blood, an observer has only to watch the striking behavioral parallels between the two primates to know that our connection is more than just a pretty face.[5] Homo sapiens' insatiable needs for sex and violence are matched only by our chimpanzee brethren. Jealousy, envy, lying, and even altruism are well developed in the Pan genus. Two separate tribes couldn't be more alike, and it's not coincidence.

Oreopithecus arrived on the scene roughly 13 million years ago, which was a long time after proconsul.[6] Its more popular name is the *Swamp Ape*, because it lived in the warm, swampy regions of central Italy. The date that I've assigned is controversial, and while many agree, there are many who think that oreopithecus evolved more recently. However, the lignite beds in which these fossils were discovered are between 10 and 16 million years old. A short explanation about how the dating of fossils is performed may be enlightening.

Let's say that a Swamp Ape died, and its body dropped to the ground. Every trace of that corpse would vanish within a month unless something interfered and the carcass was preserved. In this actual example, that *something* was a lava flow that encased the ape. Within the molten rock are many elements and minerals, two of which are potassium and

argon. Argon is a gas that rarely interacts with other minerals, and it's assumed that practically every molecule of argon escapes lava before it hardens, leaving only potassium in the newly formed rock. A variety of potassium, called an isotope of potassium, has a half-life of 1.3 billion years. This means that half of the potassium in the lava will decay (convert) into argon at the end of that time. When scientists tested the rocks in which our Swamp Ape was embedded, they calculated that only 1% of the potassium had decayed into argon, giving them a date of 13 million years ago.

This was an easy illustration, and there are many different radiometric tests available. Usually, more than one test is used for a given sample so that the accuracy of the results is within 1% of the fossil's true age. The disagreements over the actual time of origin of oreopithecus stem from the contentious *genetic clock* tests performed by biologists.[7] Genetic-dating testing is a science in its infancy, and more comprehension and patience are needed to shake the kinks out.

Biologists thought that they had discovered, within all living organisms, an evolutionary "clock" that ticks away with the precision of a Swiss watch. At regular intervals, supposedly, each species' clock notches a mutation in its DNA. The mutation is a slight change in a nucleotide of the DNA. By measuring the number of mutations of each of the various species on earth, biologists thought that they could determine the exact dates of the evolutionary beginnings of each taxonomic group through backwards extrapolation. So far, the results are disappointing because the standard errors are unreasonably high. Mutation rates differ greatly among species, and the evolutionary variables are far from fully understood. It's important to stress that all competent anthropologists study the bones and perform radiometric tests, as well as molecular testing. It's the incompetent scientist who examines *only* the bones, or reads *only* the genetic clock printout.

Oreopithecus looked like a slightly undersized chimpanzee. It was suited for arboreal life, and when it roamed the ground, it was probably a knuckle-walker, just like its great ape cousins. Yet, there were differences between chimpanzees and the Swamp Ape, and those differences began in the oral cavity—the mouth.

It was much too early in the evolution of hominid teeth to compare the molars and incisors of Swamp Ape to advanced human dentition; but still, the teeth of oreopithecus were noticeably reduced in size compared to those of the chimpanzee. The long, threatening canines that are standard issue for the great apes were diminished, and the simian tooth diastema disappeared. Swamp Ape's pelvis was already shorter and wider than its pongid contemporary, and fossils reveal that the iliac fossa and ischium were taking shape for a future of erect walking. Most striking of all were Swamp Ape's highly dexterous hands and wrists. The carpals, metacarpals, and the range of motion of the wrists were so close to human anatomy and physiology that it might have been possible for Swamp Ape to legibly write with a pen.

Swamp Ape wasn't the only contender for the title of "proto-human"; and for a long while, it seemed that *Ramapithecus* would grab the crown.[8] However, the hands couldn't be ignored, because, after all, tool making and tool manipulating are all about the hands. And after much ado, it seems that oreopithecus was the first of the order of Primates to cross the threshold from Panina to Hominina. It was the first to make the evolutionary split from chimpanzees, and that was in the Serravallian age of the Miocene epoch, almost 13 million years ago.[9]

NOTES

1. "Proconsul," Prehistoric Wildlife, www.prehistoric-wildlife.com/species/p/proconsul.html.

2. The Editors of Encyclopaedia Britannica, "Dryopithecus: Fossil Primate Genus," Encyclopaedia Britannica (April 2, 2018), https://www.britannica.com/animal/Dryopithecus.

3. C. S. Coon, *The Origin of Races* (New York: Alfred A. Knopf, 1962), 153-164.

4. Kevin E. Langergraber, Kay Prüfer, Carolyn Rowney, Christophe Boesch, Catherine Crockford, Katie Fawcett, Eiji Inoue, Miho Inoue-Muruyama, John C. Mitani, Martin N. Muller, Martha M. Robbins, Grit Schubert, Tara S. Stoinski, Bence Viola, David Watts, Roman M. Wittig, Richard W. Wrangham, Klaus Zuberbühler, Svante Pääbo, and Linda Vigilan, "Generation Times in Wild Chimpanzees and Gorillas Suggest Earlier Divergence Times in Great Ape and Human Evolution," Proceedings of the National Academy of Sciences of the United States of America, www.pnas.org/content/109/39/15716; Jeff Hecht, "Ape Fossils Put the Origin of Humanity at 10 Million Years Ago," *NewScientist* (October 2, 2015), https://www.newscientist.com/article/dn28274-ape-fossils-put-the-origin-of-humanity-at-10-million-years-ago/.

5. William Mullen, "Five-Year Effort Produces a Registry of Blood Types for Captive Great Apes," The Washington Post, Nation (January 2, 2011), http://www.washingtonpost.com/wp-dyn/content/article/2011/01/03/AR2011010306095.html?noredirect=on.

6. Coon, 209-215.

7. Soojin Yi, "Neutrality and Molecular Clocks," *Nature Education Knowledge* 4, no. 3 (2013), https://www.nature.com/scitable/knowledge/library/neutrality-and-molecular-clocks-100492542.

8. Coon, 203-205.

9. Charles Q. Choi, "Fossil Reveals What Last Common Ancestor of Humans and Apes Looked Like," Scientific American, LiveScience (August 10, 2017), https://www.scientificamerican.com/article/fossil-reveals-what-last-common-ancestor-of-humans-and-apes-looked-liked/.