

## **Modern Homo sapiens mixing with Neanderthals or just friends with benefits -**

### **Did interbreeding of Anatomically Modern Homo sapiens and Neanderthals**

#### **result in variations we see today?**

Technology is advancing in leaps and bounds. It seems every year the speed of processors has doubled, the amount of available ram storage has tripled, and there have been four new versions of the Apple iPhone. With these technological advancements, Anthropology has not so much been affected by the influence as it has been aided. With the internet, researchers can now access data and literature, pull up maps, satellite images, specimen pictures, even publish their findings and have someone on the other side of the globe read it in a matter of minutes. This new level of technology is also helping many new findings support existing theories and help refine things we already know. They are also adding evidence to both sides of the debate of whether modern humans interbred with Neanderthals; and if not, then what is the evolutionary path of modern humans and how closely related are they to Neanderthals?

Not long ago the general consensus was that hominids (*Homo erectus*) left Africa about 1 million years ago. Newer discoveries show that *Homo* left Africa nearly twice that long ago or even earlier. Fast forward to 30,000 years ago and the only two known hominids left are the Anatomically Modern Homo sapiens (AMHs) and the Neanderthals. AMHs migrated out of Africa into Europe and found non-modern hominids, or Neanderthals, in almost all locations scattered throughout the Old World from Europe to China. But what happened to the Neanderthals? This question has led to two theories: (1) Multiregional Continuity Theory and (2) Replacement Theory.

Multiregional Continuity Theory states that hominids first migrated out of Africa about 2 million years before AMHs. Over time, geographical separation, and genetic drift, separate groups all evolved independently toward modern human characteristics. Each regional group having these unique

characteristics would be the start of our modern racial differences. Multiregional Continuity theorists contend that these regional characteristics, like Neanderthal characteristics in modern Europeans and Archaic features in East Asians support this hypothesis. One of the major problems with this theory is that very few anthropologists support the idea that these separate species would all evolve towards the same result. This has caused some Multiregional Continuity Theorists to propose the idea of a “Soft Replacement” theory to go along with M. C. Theory. This Soft Replacement theory states that AMHs evolved first in Africa, spread into regions already inhabited with non-modern hominoids and then mated with the indigenous groups, producing the ethnic variations and regional differences we see today. A research team led by Damian Labuda of the Department of Pediatrics at the University of Montreal claims that some of the X chromosome found exclusively in people outside of Africa originated from Neanderthals. They ask the question of whether the Neanderthals who were physically stronger and possessed the gene for language were in fact a separate species or could have interbred with modern humans. They say yes. The Neanderthal genome was sequenced in 2010, and after comparing 6000 chromosomes from all parts of the world, it was found that the Neanderthal sequence was present in people in all continents (including Australia) except Africa. This supports the theory that Anatomically Modern Homo sapiens migrated out of Africa and mated with the current Neanderthal populations existing in the Old World. The current thought is that this scenario is perhaps possible but it is not widely supported. Many anthropologists believe there is a better theory for the disappearance of Neanderthals.

Replacement Theory, also known as the *Out of Africa model*, takes a more “survival of the fittest” standpoint. It states that Anatomically Modern Homo sapiens first evolved in Africa independently and then 100,000 years ago spread out into Europe and China. The new groups out-competed the existing inhabitants and eventually replaced them. Supporters of this theory don’t care if these AMHs engaged in some “soft replacement” with the current tribes of Neanderthals they found but that the AMHs

replaced the Neanderthals as the dominant species; instead of hybridization between the two and their offspring becoming the dominant members of Europe and Asia. Researchers from the University of Cambridge state the Neanderthal genome found from Europe to Asia can be traced back to a common ancestor. Populations of this ancestor would have been spread across the continents; with populations closer together being more genetically similar to each other and populations further apart having greater genetic differences. Then about 300 – 350 thousand years ago, the European range and the African range became separated. The hominids in the European region evolved into Neanderthals and those in the African region evolved into what we consider modern humans. When the modern humans expanded out of Africa, into Europe and across Asia, they would have brought these additional genes shared by our common ancestor and similar to Neanderthal. The similar genetic makeup and shared traits of modern humans to Neanderthals would have had an advantage in the European region and became more prominent; whereas in the African region these same similarities would have literally vanished from the genome.

So which is it? Are we part Neanderthal or just a distant “cousin”? A 25,000 year old skeleton found at the Portuguese site of Lagar Valho shows characteristics of both Neanderthals and Modern humans. Some are saying this is the smoking gun that Anatomically Modern Homo sapiens and Neanderthals interbred. Others say this is just a stocky human and there still isn't enough archaeological, genetic, and fossil evidence to support a large amount of Neanderthal/Modern human interbreeding. New advancements in technology are leading to a possible new branch of physical anthropology focusing on the molecular makeup of human genetics. This “Molecular Anthropology” goes deeper into the other disciplines of Anthropology at the molecular level and tries to trace the history and evolution of humans through DNA. The problem here is the limited amount of DNA over 10,000 years old and Neanderthal remains have been found at locations dating back to 130,000 years ago. But DNA has been successfully recovered in several Neanderthal remains each over 30,000 years old. This is definitely a limiting factor

to Molecular Anthropology and its ability to add grounds to these debates. Recent findings from an international research team have found evidence supporting that Neanderthals were on the verge of extinction 50,000 years ago. Their data shows the Neanderthals may have been more sensitive to the dramatic climate changes of the last Ice Age and small populations struggled to survive before modern humans arrived in the area. These findings are based entirely on severely degraded DNA and it took the involvement of experts around the world before any claim could be made. Perhaps other findings like this and even more advancements in technology will result in solid evidence that will finally put an end to these questions.

## Works Cited

- P, Cameron M, and Evan S. Anthropology for Dummies. Hoboken, N.J: Wiley, 2013.
- Silvertown, Jonathan W. 99% Ape : How Evolution Adds Up. Chicago: University of Chicago Press, 2013.
- "Non-Africans Are Part Neanderthal, Genetic Research Show." Science Daily. 18 Jul. 2011  
<http://www.sciencedaily.com/releases/2011/07/110718085329.htm>
- "Research Raises Doubts About Whether Modern Humans and Neanderthals Interbred."  
Science Daily. 13 Aug. 2012. <http://www.sciencedaily.com/releases/2012/08/120813155521.htm>
- "European Neanderthals Were On the Verge of Extinction Even Before the Arrival of Modern Humans".  
Science Daily. 25 Feb. 2012. <http://www.sciencedaily.com/releases/2012/02/120225110942.htm>
- Braden, Gregg. Deep truth : Igniting the Memory of Our Origin, History, Destiny, and Fate. Carlsbad, Calif: Hay House, 2013.
- Darwin, Charles, and David Quammen. On the Origin of Species. New York: Sterling, 2013.
- "How Technology Is Changing Anthropology." Diss. 2009. *Yahoo! Contributor Network*. Web. 1 April 2013