

To Be Human

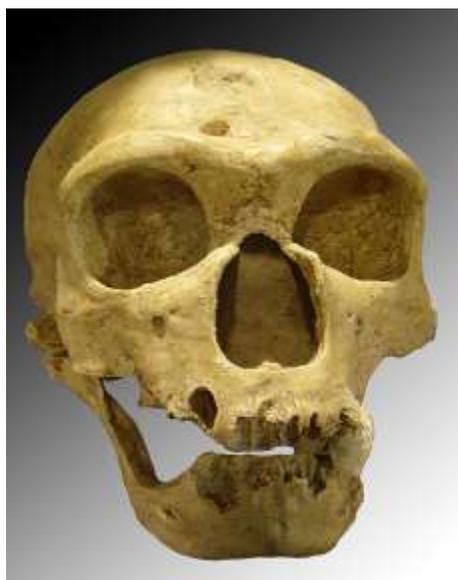
An article in the most recent issue of *National Geographic* magazine (July 2013) made me think about what it means to be human, and how we—as a species of animals—are at once so similar and so different from the other millions of life forms that inhabit the planet. The article was on the discovery of a new branch of human evolution, a new species (or sub-species, perhaps) that was almost, but not quite, the same as us.

The story began in mid-2008 when a small fragment of bone was discovered in Denisova Cave in southern Siberia. The cave, a natural shelter from the sometimes harsh environment, had evidence of human and animal habitation dating back many millennia. It allegedly took its name from a hermit named Denis who had lived there in the 18th century. Archeologists and anthropologists had been digging there for years, exploring the abundant evidence of previous habitation by both Neanderthals and modern humans.

One of the great revolutions in tracing the history of mankind has been the advances made in DNA technology. On a personal basis, I discovered that I have Oriental roots, that Mongolian blood flows in my veins, and despite fact that my family has lived in this country for centuries I have distant relatives in the Middle East. The holy grail of anthropology these days is the search for ancient human DNA, fragments of complex organic molecules that hold the potential to trace our evolutionary origins.

The bone fragment found in the Denisova cave appeared to be human, most likely a bit of a fifth terminal phalanx, or more commonly, a “pinkie bone.” It was sent to the lab of a DNA expert in Leipzig, Germany for analysis. To his shock, the results indicated that the person from whom this bone originated seemed to be from a new, and previously unknown, branch of human evolution.

Humans are higher primates. Our species appears to have originated in central Africa, migrating over many thousands of years throughout the world, first to the Middle East and Europe, then on to Asia and beyond. When our direct ancestors reached Europe, they discovered they were not the first humanoid species there. They found Neanderthals (*homo neanderthalensis*), their biologic cousins, and in some cases interbred with them. Today, modern *homo sapiens* have, on average, about 2.5% Neanderthal DNA. Eventually the Neanderthal population died out, completely replaced by (or perhaps absorbed into) human populations.



Neanderthal Skull

The human family tree is full of biologic dead ends. These are well documented in the archeological record, but recent finds continue to amaze. In 2003, for example, evidence of a new humanoid species

was discovered on the Indonesian island of Flores. Given the biologic name of *homo floresiensis*, they stood on average only about three feet tall. The evidence suggests they may have died out as recently as 12,000 years ago. DNA testing has not been done due to lack of biologic material, thus the debate continues to rage as to whether they represent another branch on the human tree, or represent modern humans who underwent further evolution in an isolated island environment.

The place of the Denisovians on the chart is still uncertain. The current thinking—according to *National Geographic*—is that modern humans and Neanderthals shared a common ancestor about 500,000 years ago, with the two evolutionary lines diverging at that point. It appears that the Denisovians are a branch off the Neanderthal line, the split occurring perhaps 250,000 years ago. More testing is being done, and perhaps in the future the answer will be clear. Like the Neanderthals, they interbred with modern humans. Today, some Pacific Islanders incorporate between 2.5% and 5.0% Denisovian DNA.

So, religious and ego considerations aside, we humans are not as unique as we sometimes think we are. Not only do we carry DNA from other human subspecies, we share a genetic link with “lower” animals. 47% of our own DNA and that of a fruit fly are the same. 88% is the same as that of a mouse. 90% is that same as that of a chimpanzee, yet the gulf between those species we consider “animals,” and ourselves as humans is enormous.

It’s something to think about.