Why Human Ancestry Matters: Crash Course Big History 205

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Hi, there.

I'm Emily Graslie and welcome to CrashCourse Big History. Today, we'll be discussing human ancestry and genealogy, important for understanding where we come from and how we relate to each other today.

Looking at the modern science on the topic the evidence points toward conclusions that unify humanity into a closely knit family, reminding us of our common identity. Our species, Homo Sapiens came into existence approximately 200 to 250 thousand years ago, foraging for generations in East Africa. These early humans were a very small population with fairly limited genetic diversity.

In fact, studies of human mitochondrial DNA -- the small amount of DNA that exists outside of the nucleus of a cell -- have concluded that the ancestry of every human alive today goes back to a single common ancestor from around this time. Over the next hundred thousand years, we spread across Africa down to the Southern Cape and into West Africa. The low population numbers of human foraging groups and their relatively disconnected communications with each other allowed for the genetics of African foragers to begin diversifying.

With population growth over the next several tens of thousands of years more connections were made between foraging groups and human genetics became more uniform again all over Africa. Let's go to the thought-bubble. Around a hundred thousand years ago humans moved out of Africa into the Middle East and maybe making it as far as India.

According to genetic studies, the migration may have been due to a population boom as humans got better and better at hunting and gathering. We can already see collective learning at work. Then, disaster struck.

Around 74 thousand years ago the gene pool contracted significantly and shrank to only about 3,000 to 10,000 people in the entire world. The best explanation we have for this -- among the number of other contenders -- is the super eruption that happened around that time at Mount Toba on the island of Sumatra in present-day Indonesia. It may seem odd that an explosion halfway around the world afflicted the inhabitants of Africa and the near East.

But Mount Toba exploded with the estimated force of 1.5 million Hiroshima-sized nuclear bombs. A layer of volcanic ash -- an average of 15 centimeters thick -- settled over everything in South and East Asia, But also in India, Arabia and as far as East Africa. Much more ash was flung up into the atmosphere darkening the skies and obstructing sunlight in the middle of what was already an ice age.

A decade of perpetual winter for the entire globe followed with long-lasting effects for centuries. The population appeared to recover quickly after the weather improved. Over the next 10,000 years there are indications that humans went through a population boom.

In fact, the growth was so great that it is one of the primary hypotheses for why 64 thousand years ago humans made another journey outside of Africa into our largest mass migration yet. Thanks Thought Bubble! For a while migrant humans stuck to warmer climates, spreading across South and East Asia.

In a very short space of time, maybe a few centuries and at most a few thousand years, humans had colonized everywhere from Pakistan to Korea, avoiding the chillier continental climates further from the coasts. Approximately 60,000 years ago humans spread down the land bridge that existed between Indonesia and the Asian mainland. Through the use of these bridges and perhaps even seafaring rafts, humans did what no hominid group had ever done before: they landed in Australia.

Eventually, humans managed to adapt a colder climates, spreading into Central Asia and Europe approximately 40,000 years ago. A few thousand years later, we were even living in Ice Age Siberia. But we weren't the first hominid group to have done this.

In fact, there's concrete evidence that humans ran into the now extinct Neanderthals and even interbred with them. Anyone outside of Africa of Eurasian descent about 1.5 to 2 percent of their DNA is of Neanderthal origin. Another thing that no previous hominid had done was migrated into the Americas.

The dominant theory is that humans simply walked from Asia to the Americas along the Bering Strait though recent discoveries have thrown the exact dates into question. But genetic tests show that humans emigrated out of Siberia, perhaps hunting animals and moved into the land bridge between Russia and Alaska as early as 30,000 years ago. At this point, we would have been prevented from traveling past the glaciers that blocked us from entering the rest of the Americas.

But either by the thaw of those glaciers or a coastal route or both, humans spread into the Americas around 13 to 16 thousand years ago, rapidly heading south. But let's jump backwards a bit, In evolutionary terms, seventy four thousand years ago is not that long at all. And a few thousand people is a tiny gene pool of relatives.

Humans are very closely related for a mammalian species. When humans left Africa 64,000 years ago, they left in small foraging bands of a few dozen at a time. It was a decidedly smaller population that eventually ballooned from all of the new resources that the rest of the world had to offer.

What differences there are between ethnic groups are pretty small. Certain diseases are more common in some groups than others, but you see the same pattern occur within individual family histories. Largely superficial and cosmetic traits differ from region to region.

One of the most prominent traits by which we have historically distinguished human from human is skin color which is caused by the melanin levels in our skin. Melanin is useful because it dissipates UV radiation and helps prevent the occurrence of skin cancer -- particularly useful in areas with lots of sunshine. A hundred thousand years ago, every human on the face of the Earth was African.

Melanin levels were roughly the same and it was only when we spread out into other regions of the world 64 thousand years ago into different climates with differing degrees of UV radiation did that slowly begin to change. According to genome research, the humans who arrived in India, East Asia and Europe between 60,000 and 40,000 years ago had dark skin tones. And until very recently, they retained that appearance.

Specific genes that led to depigmentation only became active when humans entered regions where they weren't getting enough sun and thus not as much vitamin D. But even this change took thousands upon thousands of years. Researchers have determined, for instance, that until eight thousand to ten thousand years ago, there were no white people.

These ethnic distinctions are blurred even further by the extreme mobility of different peoples across the ages and especially since 500 years ago when all of the world zones began uniting into a single global system. A great many people have mixed ancestries as a result. In fact, if you got your genome tested there are

reasonable odds that your ancestry is pretty diverse too.

It's worth asking why we've had a long tortured history involving war, murder, slavery and genocide over our differences. Plenty of primates from new and old world monkeys to great apes like gorillas and chimpanzees show hostility toward their own species and intergroup encounters arising out of competition for food and mates. For instance, chimpanzees are known to range from their territories to find strangers to ambush, mutilate and sometimes kill.

Hostility, fear, wariness and caution are visceral traits that go back millions of years into our evolutionary history. Humans, who aren't much better except when we apply logic and reason, distinguished between groups by tribal markers. Humans are good at understanding symbolism and here we put it to poor use.

Different body paints, dialects and fashions in groups that were otherwise, ethnically indistinguishable led to great rivalries and generations of conflict. Once humans started diversifying in appearance, as languages grew more distinct, as religions became more distant and as battles for resources continued -- these tribal markers also intensified. From a good instinct to be wary of strangers came the learned behavior of judging a person by their outward traits.

Then came Charles Darwin in the Theory of Evolution: a great leap forward. Soon after, came the abuse of evolution which was a great leap backwards. In the 19th and early 20th centuries, all the old prejudice has found a new explanation, displayed with a thin veneer of scientific credibility.

Darwin's on The Origin of Species, made almost no mention of humans. Deliberately. While evolution had the makings for hard science when applied to different species, when applied hastily to Homo Sapiens it had all the makings of pseudoscience.

On the one hand, until the 1950s and the discovery of DNA and the synthesis of various parts of Darwinian Theory, humans had a very poor understanding of genetics and how closely related humans really were. A lot of the discoveries about our close ancestry were only uncovered in the second half of the 20th century by more archaeological findings and the sequencing of the human genome. On the other hand, natural selection which proved revolutionary to biology was sometimes inappropriately applied to human groups.

Differences in behavior that we ascribed to cultural learning today were given a biological explanation. For instance, even Darwin in The Descent of Man hypothesized that more emotional cultures And more reserved cultures were the result of inherited traits rather than just how people are raised to behave in those societies. Some of this was more sinister.

Carl Vogt, a German pseudoscientist set out in the 1860s to prove that Africans were a different species from Europeans. Ernst Hafckel in the 1880s put forth the theory that humans evolved in Asia, not Africa and that different major ethnic groups had actually separate primate ancestry, meaning we were divided not by a few thousand years but by millions and millions of years of evolution. He then talked about superior and inferior groups.

With European Imperialism on the rise, pseudoscientists grasped toward unsupported theories. Cranial measurements and a whole range of justification for their biases. In the 1890s, this competition between western empires heated up.

Figures like Georges Vacher de Lapouge and William Ripley subdivided Europeans into different superior and inferior groups as well. This contributed to the intensification of scientific racism in 20th Century Europe and fed the rise of fascism. This kind of thinking spread all over the world in the 20th century and some element of scientific racism can be found in the Sino-Japanese Wars and conflicts in Rwanda, Sudan and others on a tragically long list.

Ignoring our common ancestry continues to have modern consequences. We humans have been warring for millennia, and it pays to remember the story of our origins and how closely related we actually are, especially as we move forward as a global society into the 21st century. Just like the Big Bang reminds us of a single point of origin for all matter and energy in the universe, the story of humanity reminds us of our common identity.

What diversity there is, is cultural which I think is something to celebrate. We should especially celebrate the diversity that is most crucial to human genius and collective learning: the diversity of thought. Thanks for watching.

We'll see you next time. CrashCourse Big History is filmed in the Chad and Stacey Emigholz studio in Indianapolis, Indiana and is produced with the help of all of these nice people. Our animation team is Thought Cafe.

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