# 6.3

# GENEALOGY AND HUMAN ANCESTRY

**0:11–1:02**

CHROMOSOMAL DNA

I'm Henry Louis Gates Jr., and I'm a professor at Harvard University. I first became interested in the field of genetics when I was nine years old. And it was the day that we buried my grandfather. And I was standing there looking at his casket, trying to figure out why he looked so white. And it turns out 40 years later, I got the answer through the science of genetics.

Scientists analyzed my Y DNA, my Y chromosome. Remember, you have 23 chromosomes across your genome. And your Y DNA, if you're a man, you inherit from your father. Y DNA is what makes a boy a boy and makes a man a man and it's an identical genetic signature or fingerprint. In analyzing my Y DNA, they were able to say that my grandfather looked like a white man because his grandfather was white.

**1:02–1:51**

MITOCHONDRIAL DNA

My great-great-grandfather, in other words, was an Irishman. That's right, I have something called the O'Neill haplotype that I inherited from my father who got it from his father and from his father. And our haplotype is shared by eight percent of all the men in Ireland. An Irishman impregnated my oldest black ancestor, Jane Gates, and I am his descendent.

And we also know that through my mitochondrial DNA, which you—everybody, male and female, boy and girl—which everybody inherits from their mother. It too is an identical genetic signature or fingerprint and it goes back thousands and thousands of years. And we know that I'm also descended from an Englishwoman who was impregnated by a black man sometime in slavery.

**1:51–2:54**

GENETIC ADMIXTURE

And we know through a third test, an admixture test, which measure... looks across one million positions across your whole genome and it tells you your percentages of African ancestry, European ancestry, an Asian or native American ancestry back for the last 500 years, back to the time when Christopher Columbus encountered the new world for the very first time.

And we know that I am, surprise, surprise, 50 percent white and 50 percent black through my admixture test. Well, genetics could not only tell you your own family tree or personal history, genetics reveals the history of the human species. 60,000 years ago, all of our ancestors, no matter what you look like today—whether you're Asian, whether you're black, whether you're Latino, whether you're white, European—all of our ancestors were black people living in East Africa. That is the genetic Garden of Eden.

## 2:54–3:48

OUT OF AFRICA

You want to know where the Garden of Eden was? It was in East Africa. The human community evolved there. And for reasons that we don't know, 60,000 years ago, some of them decided to leave. Now, you all have families. You know why people decide to leave. Probably two brothers got in an argument or a brother and sister got mad at each other. They said, "Split time, I am out of here."

And not only did they leave whatever village they were living in, but they walked out of Africa. They walked through the Middle East, through India, to Southeast Asia over a period of thousands of years. 20,000 years later, the same human community went north to what is now Europe and to Southeast Asia, to mainland China, for example, to Japan. 15,000 years ago, the Ice Age came. So what did they do? They left the northern climes and went south again.

## 3:48–4:43

GENETIC MUTATIONS

Once the Ice Age passed, they remigrated around the world. Well, funny thing happens when you live together—people mate. And when you mate with people that you can see, people in your genetic village, you share genetic mutations which are passed down from father and mother to child.

And so there are communities of people who share genetic mutations and we can now recreate the history of mankind over the past 60,000 years from the time that first group of human beings walked out of Africa through your DNA by doing precisely the same kind of genetic analysis of your haplogroups as scientists did to me to show that I'm descended on my mother's side from an Englishwoman, and on my father's side from an Irishman.