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DNA Tests Find Branches but Few Roots

By [RON NIXON](#)

[HENRY LOUIS GATES JR.](#), whose [PBS](#) special “African American Lives” explores the ancestry of famous African-Americans using DNA testing, has done more than anyone to help popularize such tests and companies that offer them. But recently this Harvard professor has become one of the industry’s critics.

Mr. Gates says his concerns date back to 2000, when a company told him his maternal ancestry could most likely be traced back to Egypt, probably to the Nubian ethnic group. Five years later, however, a test by a second company startled him. It concluded that his maternal ancestors were not Nubian or even African, but most likely European.

Why the completely different results? Mr. Gates said the first company never told him he had multiple genetic matches, most of them in Europe. “They told me what they thought I wanted to hear,” Mr. Gates said.

An estimated 460,000 people have taken genetic tests to determine their ancestry or to expand their known family trees, according to Science magazine. Census records, birth and death certificates, ship manifests, slave narratives and other documents have become easier to find through the Internet, making the hunt for family history less daunting than in years past.

Yet for many, the paper or digital trail eventually ends. And for those who have reached that point, genetic DNA tests may help to provide the final piece of the puzzle.

The expectations and reasons for taking the test vary. For some, the test allows them to reconnect with African ancestors after centuries of slavery wiped out links between African-Americans and their forebears. Others want to see if they have links to historical figures like Genghis Khan or Marie Antoinette. For still others, it’s an attempt to fill gaps in family histories and find distant cousins they might not otherwise have known.

The demand has spawned an industry. Almost two dozen companies now offer such services, up from just two or three only six years ago. The field is so hot that private equity investors have moved in: Spectrum Equity Investors recently bought [Ancestry.com](#), an online genealogy site, for about \$300 million shortly after the site added genetic testing as a service.

But as the number of test takers and companies has grown, so has the number of scientists or scholars like Mr. Gates who have questioned assertions that companies make about their tests. One of the most controversial issues is the ability of the tests to determine the country or the ethnic group of origin for African-Americans or Native Americans.

Mr. Gates, director of the W.E.B. Du Bois Institute for African and African American Research at Harvard, said his experience and similar stories from others have prompted him to enter the field.

Mr. Gates recently teamed up with Family Tree DNA, a DNA testing and genealogy firm in Houston, to provide genetic testing and genealogy work for African-Americans. The new venture is called AfricanDNA.

“What we hope to do is combine this with genealogical and other records to try to help people discover their roots,” he said. “The limitations of current genetic DNA tests mean you can’t rely on this alone to tell you anything. We hope to bring a little order to the field.”

In an editorial in *Science* magazine in October, a number of scientists and scholars said companies might not be fully explaining the limitations of genetic testing, or what results actually mean.

The authors said that limited information in the databases used to compare DNA results might lead people to draw the wrong conclusions or to misinterpret results. The tests trace only a few of a customer’s ancestors and cannot tell exactly where ancestors might have lived, or the specific ethnic group to which they might have belonged. And the databases of many companies are not only small — they’re also proprietary, making it hard to verify results.

“My concern is that the marketing is coming before the science,” said Troy Duster, a professor of sociology at [New York University](#) who was an adviser on the Human Genome Project and an author of the *Science* editorial.

“People are making life-changing decisions based on these tests and may not be aware of the limitations,” he added. “While I don’t think any of the companies are deliberately misleading customers, they may have a financial incentive to tell people what they want to hear.”

Bennett Greenspan, founder and president of Family Tree DNA, said his company sometimes has to tell clients just the opposite. “We’ll have people who may think that they have a certain type of ancestry and we’ll tell them based on the test they are not,” he said. “I can only tell them what the tests show, nothing more. And sometimes it’s not what they want to hear.”

HERE’S how the test works: A customer swabs his or her cheeks and gums, collects microscopic tissue samples and sends them to a laboratory. The lab extracts and digitizes the DNA and sends the results back to the companies. Using computer software, the companies try to identify matches between the customer’s DNA and those in their databases.

The test, which costs \$100 to \$900, typically comes in two forms. One test analyzes mitochondrial DNA, which reveals information only about a person’s maternal line, traced back through the mother’s mother to other female forebears (but not the males, because mitochondrial DNA is passed to all children only from their mothers).

The second test looks at the Y chromosome, which can provide clues only about a customer’s paternal line — so only men can take the Y-chromosome test.

Several companies, including DNA Tribes of Arlington, Va., also offer a test that examines the DNA contribution of both parents. These tests are the most controversial because many scientists say there isn’t enough data yet to get accurate results.

Mitochondrial and Y-chromosome tests combined reveal information pertaining to just 1 percent of a person’s DNA. But testing companies say that this 1 percent can reveal a lot about a person and bridge gaps in paper

records. Mr. Greenspan said that anyone who starts to research his or her family history will eventually encounter roadblocks.

“This is where DNA comes in and offers clues that might otherwise never be known,” said Mr. Greenspan, who started Family Tree DNA in 2000, after encountering his own roadblocks while researching his Jewish ancestry. “Can it answer all your questions? No. But used in combination with other tools, it can be extremely helpful.”

Gina M. Paige, president of African Ancestry Inc., based in Washington, said the DNA tests could be even more important for people whose lineage is loosely or sparsely documented.

“For most African-Americans, there is no paper trail,” Ms. Paige said. Speaking of her company, she added, “we make money, but we see this as a service to a people who have been cut off from their history and culture.”

Sharing that view is the actor [Isaiah Washington](#), formerly of “Grey’s Anatomy” and now appearing on “Bionic Woman” on NBC. After taking a DNA test to determine his ancestry in 2005, he says African Ancestry told him that his maternal ancestors most likely came from the Mende people in Sierra Leone. “I was excited because I didn’t know what to expect,” he said. “I remember watching ‘Roots’ when I was young and it stuck with me. I always wanted to know where my ancestors came from before slavery, and here you have the science telling you.”

Still, Benjamin Todd Jealous, president of the Rosenberg Foundation in San Francisco, a nonprofit group that finances social programs, said it’s important that customers not expect too much from DNA tests. Family Tree DNA examined the DNA of Mr. Jealous’s grandfather before he died last year. The test showed both European and African ancestry, which wasn’t surprising to family members, but it also connected them to an ethnic group in Africa that they had never heard of.

“Over all, I think we were satisfied with the service we received,” Mr. Jealous said. “But again, it’s a relatively new area, so we went in not expecting a lot. Some people are looking for definite answers.”

The author Edward Ball had a different experience with DNA ancestry tests.

A native of Savannah, Ga., Mr. Ball has a new book, “The Genetic Strand,” (Simon & Schuster) that explores his family history through DNA. He became intrigued when he found labeled hair samples of various family members hidden in a drawer; some of the hair was more than 100 years old. He sent it to various companies for DNA testing. The first tests found that some of the family’s DNA was American Indian. Another company found African genes in his family tree, but no Native American ones. Then he was told by one of the various experts he consulted that the DNA most likely originated in Northern Europe. Mr. Ball didn’t know what to believe.

“My sense of family and identity were radically altered,” he said. “Then it simply became confusing after getting ambiguous and contradictory results.”

EVEN some early proponents of DNA testing for ancestry have doubts about how useful the tests are.

Bert Ely, a geneticist at the [University of South Carolina](#), was a co-founder of the African-American DNA Roots Project in 2000, hoping to use DNA tests as a way to find connections between African-Americans and ethnic groups in Africa.

“I originally thought that the mitochondrial DNA test might be a good way for African-Americans to trace their country of origin,” Mr. Ely said. “Now I’m coming to the opposite conclusion.”

Last October, he matched the DNA sequences of 170 African-Americans against those of 3,725 people living in Africa. He found that most African-Americans had genetic similarities to numerous ethnic groups in Africa, making it impossible to match African-Americans with a single ethnic group, as some companies assert they can do.

Mr. Ely also published a paper in which he tried to determine whether the country of origin of native Africans could be found by using mitochondrial DNA tests. Several of the Africans in the study matched multiple ethnic groups. For example, DNA results for a person from Ghana provided genetic matches with people in 20 African countries.

Other scientists have raised issues with the way companies analyze and present results. Of particular concern is the use of statistical methods to determine ancestry when there are multiple matches to different ethnic groups. Companies don’t always make it clear that the results are estimates, not definitive matches.

It’s not that the tests are wrong, scientists say. Most companies use the same methods and, in some cases, the same labs to extract DNA from samples. But even the largest databases have only a few thousand records in them, and some areas and populations are sampled more than others. Most companies get data from information published in publicly available research papers; few collect samples themselves. Scientists emphasize that much of this data was gathered for other purposes and was never intended to be used for personal genealogical testing.

For their part, testing companies say they continually update their databases to get a larger number of samples.

AS part of the reporting for this article, I decided to submit my own samples for a mitochondrial DNA test. “Roots” had left an impression on me, as it had on Mr. Washington. Like most African-Americans, I longed to know where I came from. Could tests tell me?

I often travel to Africa, and no matter where I go, someone will say that I must belong to one of the ethnic groups there. I’ve always wondered if any of them could be right. Could I really be an Igbo or a Mende?

There were also stories in my family about Native American or European ancestry. What, if any, of this was true?

Six weeks after I submitted the first samples, the results started to roll in. Every company told me that my mother’s female ancestors were all African. But after that, things got murky.

African Ancestry said my DNA was a match with that of the Mende and Kru people from Liberia. Family Tree DNA’s database showed a match with one person who was Mende. But my DNA also matched that of several other groups, like the Songhai in Mali, and various ethnic groups from Mozambique and Angola. Other peoples cited were the Futa-Fula (also known as the Fulani), who live in eight African nations, and the Bambara, who are primarily in Mali.

Why so many? “We try to be brutally honest and give you everything the test results show,” said Mr. Greenspan of Family Tree DNA. “If there are multiple matches, we’re going to show you that.”

Mr. Ely's African-American DNA Roots Project, which examined DNA sequences that other companies provided to me, confirmed many matches from Family Tree DNA and African Ancestry, but added additional ethnic groups. DNA Tribes, whose test shows DNA results from a combination of genetic material from both parents, added even more ethnic matches.

I once thought that my ancestors, like those of most African-Americans, would have come from West Africa. But some of the results showed links to regions that I had thought weren't engaged in the slave trade with the United States — like Mozambique. But then a search of the TransAtlantic Slave Trade database, which was compiled from slave ship records, showed that some Africans from Mozambique did indeed end up in the United States. So maybe the Mozambique results were possible.

The companies also offered technical support to understand the results, and I spent considerable time trying to make sense of them. I learned a lot about how they reached conclusions, but not much about where I or my ancestors ultimately came from.

“What this all means is that you can't take one of these tests and go off and say you're this or that,” Mr. Gates said. “Somewhere down the road, the results could change and you might have another group of people who might also be your genetic cousins.”

Sandra Jamison contributed reporting.

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