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THE HISTORY OF GENETIC GENEALOGY AND UNKNOWN PARENTAGE RESEARCH: AN INSIDER'S VIEW

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Editorial

The History of Genetic Genealogy and Unknown Parentage Research: An Insider's View

CeCe Moore

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When the last issue of JOGG was published in the Fall of 2011, using genetic genealogy to identify recent unknown parentage was in its infancy. Genetic genealogists were squarely focused on using DNA to learn more about our distant ancestors and conquer our genealogical brick walls. Around that time, I became aware of a whole category of people who were denied knowledge of their genetic origins and the joy of building a family tree, at least one tied to their biological ancestors: those with unknown parentage. There were also a surprising number of genealogists taking DNA tests and discovering, unexpectedly, that half of their trees, often the results of decades of research, was not their true genetic pedigree.

As a genealogist, I feel strongly that everyone has the right to explore their genetic origins, research their ancestors, and participate in the popular hobby of genealogy. As I learned, for many adoptees and others of unknown parentage, this had proven impossible. It seemed obvious that genetic genealogy could help them.

Prior to the introduction of commercial autosomal DNA testing for genealogy in late 2009, to my knowledge, there were only a couple of men who had resolved their unknown paternity using Y-DNA testing. Notably, Richard Hill was profiled in the *Wall Street Journal* for his discovery of his biological paternal heritage in 2009 (Naik, 2009). He later self-published the book *Finding Family: My Search for Roots and the Secrets in My DNA* (Hill, 2012). But for the majority, resolving unknown parentage was an elusive goal. In 2011, the 23andMe and FTDNA autosomal DNA (atDNA) databases were extremely small, and AncestryDNA's had not even been created. This presented a challenge. How could we best use these data to help those who had no other information on their roots?

A group of adoptees, traditional search angels, and a genetic genealogist (myself), banded together to devise methods to harness the vast amount of genetic data generated by atDNA testing (even with the smaller databases of the time) for unknown parentage searches. In those early days, the matches were almost always distant, 4th to 6th cousins and beyond, so in most cases, segment triangulation made sense.

Segment triangulation entails grouping matches together who all share atDNA with one another on the same or overlapping segment and looking for a common ancestral line among them. All of those matching on the same/overlapping segment are reasoned to share an ancestral line and, so then, should the person of unknown parentage. When common ancestors were successfully identified, teams of volunteers and adoptees spent hundreds or often thousands of hours combining the ancestral lineages of the matches and building huge family trees backward and forward in time, hoping to trace to the present to find a person who was in the right place at the right time to be the unknown parent. Citizen scientists created tools specifically to help the search community make sense of the vast amounts of data at our fingertips. Those tools ultimately benefited the entire genetic genealogy community. However, the work was grueling, and we saw few success stories. The more recent discoveries of "pile-up regions" and the true depth of atDNA matching explain some of the difficulties we unknowingly faced at the time.

It quickly became apparent to us that predicted second cousins were the "sweet spot" for identifying birthparents. If two people share about 3% (roughly 212 cM) of their atDNA, then there is a good chance that they share a set of great grandparents. Tracing the descendants of the eight great grandparents forward in time, unsurprisingly, leads to potential birth parents. As the

databases grew, we quickly saw more cases being solved in this way and with much less emphasis on segment triangulation and building huge, speculative family trees.

In mid-2012, [Ancestry.com](https://www.ancestry.com) launched their atDNA service, which had a significant effect on the way unknown parentage searches were resolved. What we had needed all along was more pedigree data for those sharing DNA. Matching segment data without the family trees of the matches was virtually useless, so the founding members of the search community had spent much of our time tracking down or building those trees. Since [Ancestry.com](https://www.ancestry.com) had long been in the business of collecting family tree data, they had a unique opportunity to correlate the pedigrees directly with the atDNA data they were quickly accumulating. In many cases, it was no longer even necessary to contact the match, making the work considerably faster and simpler. Triangulating family tree data, rather than segment data, was much more attainable and very successful in identifying shared ancestors.

Later, AncestryDNA's "Shared Ancestor Hints" automated identification of common ancestors, giving us a new, extremely valuable tool in our pursuit. Instead of spending many hours manually searching for common ancestors among the subject's matches, "mirror trees" could be created and attached to the DNA results of a person of unknown parentage to automatically search for common ancestors in the family trees of their DNA matches.

What is a mirror tree? A mirror tree is built based on the pedigree of a DNA match to the person searching. Recreating it, or even better, being invited to editor status by the owner, allows the searcher to attach their DNA results, as if the trees was their own. When it works, the Shared Ancestor Hints can quickly identify which branch of the match's tree is in common with the subject of unknown parentage by finding third parties who share both DNA with the adoptee and ancestors with the mirrored match. Speculative trees are also a very useful for unknown parentage work. By building out the family tree of a candidate birth parent as deeply as possible on all ancestral lines, one can usually determine whether the DNA of the searcher and the tree of the prospective birth par-

ent correlate well via the Shared Ancestor Hints.

In the early days of adoptee searching, we used to refer to it as "being struck by lightning" if an adoptee received a close family match in the databases. However, with the incredible growth of these databases over the last couple of years, this has become more and more common. In fact, today, in the DNA Detectives Facebook group alone (<https://www.facebook.com/groups/DNADetectives/>), we see such matches every day. When large batches of new AncestryDNA matches load, we will often see multiple half-sibling, aunt/uncle, and first-cousin matches among the members of the group. Supporting my anecdotal experience, a recent survey of people who DNA tested to find birth family found that 90% were matched to a 3rd cousin or closer immediately upon receiving their results (Bettinger, 2016). Thus, I believe that our genetic genealogy databases have hit critical mass, at least for those with deep roots in the United States, and even for those whose great grandparents were not all immigrants. It is difficult to fathom how this could be true since the total number of testers is only roughly 1% of the U.S. population, but what we are witnessing with our own eyes cannot be denied.

Experienced genetic genealogists have often joked that some people are under the misconception that they will take a DNA test and their family tree will automatically generate. In the not too distant future, this is very likely to become a reality, at least to a moderate extent. The databases are currently growing at breakneck speed and, before long, successful birth-family searches and immediate family reunions made possible through DNA testing will be as commonplace as taking a DNA test and matching to a second or third cousin is now. The experts in unknown parentage work will have to find another area on which to focus because, thankfully, the answers long-sought by those of unknown parentage will be easy to come by and these mysteries will take little special skill to unravel.

The development of genetic genealogy methods for unknown parentage searches has been an important and productive effort for our community. This work and the tools created to support it have benefited those searching for immediate biological family as well the genetic genealogy communi-

ty as a whole. Further, the media coverage of these types of cases has significantly increased public interest in our industry, attracted multitudes of new testers, and inspired new genetic genealogists. Undoubtedly, the process has reinforced the concept that learning about one's family history is a valuable and worthy endeavor for all.

About the Author

CeCe Moore is an independent genetic genealogist, an innovator in the field of unknown parentage searches, and an educator in the genetic genealogy community. She is the genetic genealogy consultant and scriptwriter for *Finding Your Roots*, the co-founder of the *Institute for Genetic Genealogy*, and the founder of *The DNA Detectives*.

Conflicts of Interest

CeCe Moore has consulted on a volunteer basis for 23andMe, Family Tree DNA, and AncestryDNA. She declares no conflicts of interest.

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