

Using Multiple Autosomal DNA Test Takers to Solve Distant Research Questions

Nicole Elder Dyer

<https://familylocket.com>

Nicole@FamilyLocket.com

Overview

Finding enough evidence for the parents of an ancestor born in the early 1800s can be difficult. The amount of autosomal DNA evidence inherited decreases with each generation, yet it can still help solve these challenging research questions. Learn how using multiple DNA test takers can help you discover potential ancestors and increase the quality and quantity of your DNA evidence. You will also learn how the concept of autosomal DNA coverage can increase your chances of finding relevant DNA matches.

Autosomal DNA Coverage

When using DNA test results to find evidence for a research subject's parent, the typical method is to find DNA matches who are descendants of the hypothesized parent. You will only be able to find these matches if you actually inherited DNA from that ancestor. The more distant the ancestor, the less likely that you inherited very much DNA from that person. You are expected to inherit **about**:

- 1/4 of a grandparent's DNA (25%)
- 1/8 of a great-grandparent's DNA (12.5%)
- 1/16 of a 2nd-great-grandparent's DNA (6.25%)
- 1/32 of a 3rd-great-grandparent's DNA (3.125%)
- 1/64 of a 4th-great-grandparent's DNA (1.5626%)
- 1/128 of a 5th-great-grandparent's DNA (0.78125%)

Due to recombination, the amount you actually inherited from each grandparent and each ancestor is not exact. Some ancestors aren't represented at all in your own genome. That's why your genetic family tree has gaps in it, as Blaine Bettinger has written about. The fact is, you didn't inherit DNA from each of your distant ancestors.¹

This is where the concept of autosomal DNA coverage becomes important. Paul Woodbury defined coverage as follows: "Coverage refers to the amount of a research subject's DNA that is represented in a DNA database through their combined tested descendants."² Paul has written and lectured about the importance of testing multiple descendants of your research subject. In his webinar, "Crème de la

¹ Blaine Bettinger, "Q&A: Everyone Has Two Family Trees – A Genealogical Tree and a Genetic Tree," 10 November 2009, blog post, *The Genetic Genealogist* (<https://thegeneticgenealogist.com/2009/11/10/qa-everyone-has-two-family-trees-a-genealogical-tree-and-a-genetic-tree/>).

² Paul Woodbury, "Covering Your Bases: Introduction to Autosomal DNA Coverage" *LegacyTree Genealogists* (<https://www.legacytree.com/blog/introduction-autosomal-dna-coverage>).

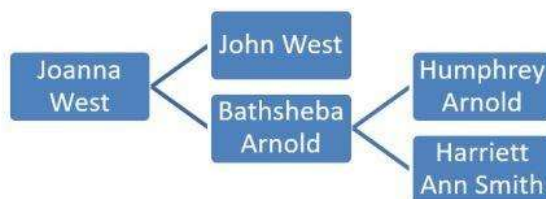
crème: Targeted Autosomal DNA Testing to Isolate Pertinent Genetic Cousins,” he discusses the concept that different descendants help illuminate different parts of your research subject’s genetic profile.³

The more coverage you have, the more relevant matches you will find. This is the exciting part of increasing coverage – discovering matches who help you form or test a hypothesis for the parents of your research subject.

Example Case

Objective: Determine if Joanna West was the biological mother of Barsheba Tharp. Barsheba was the wife of John Robert Dyer and they resided in Hawkins County, Tennessee from 1830-1880. Barsheba was born about 1813-1818 in Hawkins County, Tennessee, and was the daughter of Lewis Tharp, born 1786 in Fauquier County, Virginia. Lewis was married twice, first to Joanna West in 1805 in Fauquier, Virginia, then to Judy Vernon in 1817 in Hawkins, Tennessee.

Joanna West’s parents and grandparents had already been documented by a fellow researcher, as shown below.



If Joanna West was Barsheba’s mother, Barsheba’s descendants should share DNA with Joanna’s descendants, John West’s descendants, and Humphrey Arnold and Harriett Smith’s descendants. However, finding DNA matches whose common ancestor is so many generations back in time can be challenging. The amounts of shared DNA are small, if any DNA is shared at all.

Using only the DNA of three brothers who descend from Barsheba Tharp’s son, John James Dyer, the estimated coverage was about 11%. Figure 1 shows the estimated coverage using only the three Dyer brothers’ DNA. Figure 2 shows how much the coverage was increased by adding in test takers through multiple independent child lines of Barsheba Tharp.

³ Paul Woodbury, “Crème de la crème: Targeted Autosomal DNA Testing to Isolate Pertinent Genetic Cousins,” webinar, 6 May 2020, *Legacy Family Tree Webinars* (<https://familytreewebinars.com/webinar/creme-de-la-creme-targeted-autosomal-dna-testing-to-isolate-pertinent-genetic-cousins>).

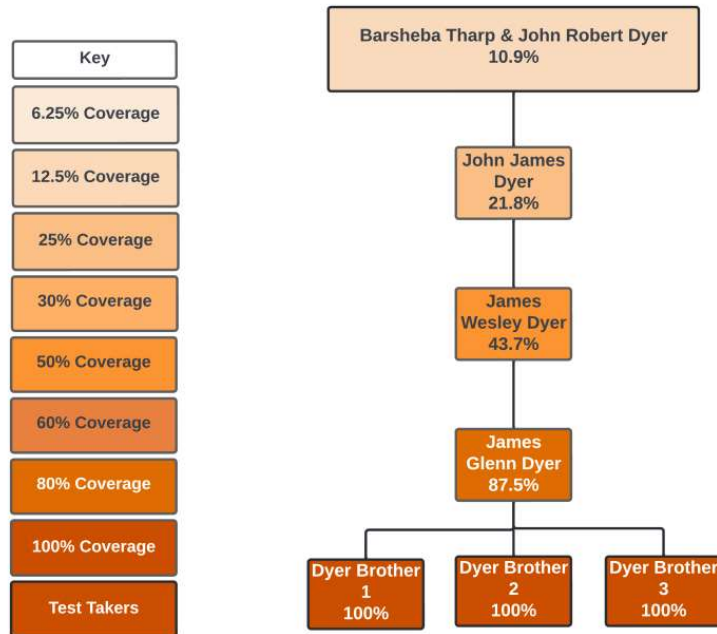


Figure 1.

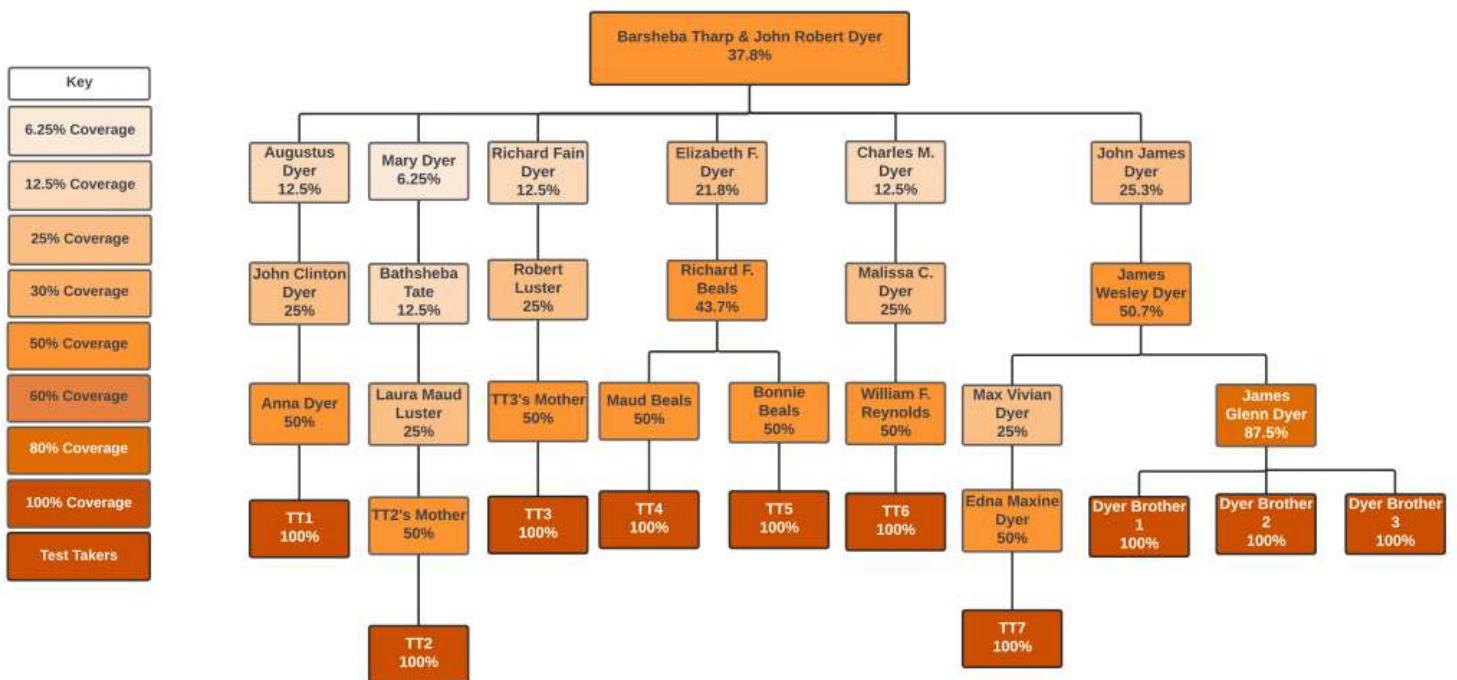


Figure 2.

By expanding the analysis to seven additional test takers (TT1-TT7), I was able to achieve about 37.8% coverage of Barsheba Tharp and John Robert Dyer. This significantly increased the number of relevant

DNA matches that were found. Correlation of documentary and DNA evidence in a proof argument made the case that Joanna West was the mother of Barsheba Tharp.

Asking People to Share DNA Results

Targeted testing is one way to increase the number of test takers you can analyze in a research project. You can also ask people who have already tested to share their DNA results. Sharing your project's objective and the current progress helps people see the value in participating in your project. Sending a link to this Ancestry help article also helps: <https://support.ancestry.com/s/article/Sharing-AncestryDNA-Results>. If you are working on a research goal that involves their ancestors, I've found that many people are willing to share their DNA results with you as a viewer or collaborator.

Coverage Estimator

To help with coverage calculations, Paul Woodbury, Leah Larkin, and Jonny Perl collaborated on a new tool at the DNA Painter website called The Coverage Estimator - <https://dnainter.com/tools/coverage>. To determine the current coverage of an ancestor, enter the relationships and names of people whose results you have access to into the tool. The tool will suggest additional test takers to increase coverage.

Additional Resources

Dyer, Nicole. *Airtable Research Logs for Genealogy*. Research Like a Pro Quick Reference PDF. Highland, UT: Family Locket Books, 2023. <https://familylocket.com/product/airtable-research-logs-for-genealogy-quick-reference/>.

----- "Creating Gephi Network Graphs Part 1: Gather Matches and Prepare Spreadsheets." 9 Sep 2022. Blog Post. *Family Locket*. <https://familylocket.com/creating-gephi-network-graphs-part-1-gather-matches-and-prepare-spreadsheets/>. Part 2 is linked at the bottom of the post, and part 3 is linked at the bottom of part 2, and part 4 is linked at the bottom of part 3.

----- "Find More Ancestors with Autosomal DNA by Increasing Coverage." 17 June 2022. Blog Post. *Family Locket*. <https://familylocket.com/find-more-ancestors-with-autosomal-dna-by-increasing-coverage/>.

----- "Find More Ancestors with Autosomal DNA by Increasing Coverage Part 2: Barsheba Tharp's Mother." 5 August 2022. Blog post. *Family Locket*. <https://familylocket.com/find-more-ancestors-with-autosomal-dna-by-increasing-coverage-part-2-barsheba-tharps-mother/>.

----- "Autosomal DNA Coverage Calculator." 24 September 2022. Blog post. *Family Locket*. <https://familylocket.com/autosomal-dna-coverage-calculator/>.

Larkin, Leah. "A New Coverage Estimator at DNA Painter." 17 October 2022. Blog post. *The DNA Geek*. <https://thednageek.com/a-new-coverage-estimator-at-dna-painter/>.

Perl, Jonny. "How to Use the New DNA Coverage Tool." 17 October 2022. Blog post. *DNA Painter Blog*. <https://dnainter.com/blog/how-to-use-the-new-dna-coverage-tool/>.

Woodbury, Paul. "Covering Your Bases: Introduction to Autosomal DNA Coverage." Blog post.
LegacyTree Genealogists. <https://www.legacytree.com/blog/introduction-autosomal-dna-coverage>.

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