

# Using Autosomal DNA to Solve a Family Mystery

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Thomas W. Jones, Ph.D., CG, CGL, FASG, FUGA, FNGS  
Tom@JonesResearchServices.com

*This case study shows how targeted autosomal-DNA testing supplemented documentary research to identify the father and grandparents of siblings born in New York State in the late 1820s. Besides the genealogical methods, the presentation addresses locating people to test, interpreting documentary research and DNA results, and applying the interpretations to help answer specific genealogical research questions.*

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Based on Thomas W. Jones, "Too Few Sources to Solve a Family Mystery? Some Greenfields in Central and Western New York," *National Genealogical Society Quarterly* 103 (June 2015): 85–103.

## A Brick-Wall Problem

- No record of Calista nor her oral history discloses her parents's names.
- The candidate for Calista and her brother's father left only three records, none naming anyone related to him. He appears in only one census.
- The candidate for Calista and her brother's paternal grandfather left no probate or land record naming his children.
- A family record of unknown origin names the grandfather-candidate's six children with his second wife, omitting twelve children with his first wife.
- Calista and her brother, their parents, and their grandparents were born, married, and had children in times and places of no government recording such events.
- The family was mobile. The candidate for Calista and her brother's grandparents moved repeatedly, appearing in a different county in each census, except the grandfather reappeared in one county after a forty-year interval.
- Calista and her brother, four generations before the researcher, were born in the late 1820s, and the candidate for their grandfather, six generations before the researcher, was born in 1787.
- Given the absence of records and the genetic distances, can the relationships between Calista, her father, and her paternal grandparents be proved?

This handout outlines the proof argument that is the basis for the case study discussed in this presentation.

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### Answer-focused Research

- Who was the father of Calista Jane Greenfield and her brother, who were born in New York in the late 1820s?
  - Who were their father's parents?
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### Research Leading Up to Autosomal DNA Testing

- Verifying family lore
  - Using indirect evidence to backtrack Calista and her brother from their county of record to their county of birth
  - Identifying a likely candidate for the siblings' father
  - Using indirect evidence to track him from birth to death
  - Using indirect evidence to identify potential candidates for the siblings' paternal grandparents
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### DNA-Testing Challenges for this Case

- The brother's line has died out, ruling out all DNA testing on that line and any Y-chromosome DNA testing from the candidate father.
  - The sister's descendants are five generations from the candidate father and six generations from the candidate grandparents, making them fifth cousins to same-generation descendants of the candidate father's siblings.
  - Inherited autosomal DNA at this genetic and genealogical distance averages about .0488 percent and 3.32 centiMorgans.<sup>1</sup> Only about 10–15 percent of fifth cousins share enough autosomal DNA to reveal a relationship.<sup>2</sup>
  - While many descendants of the sister are known, descendants of her paternal aunts and uncles—candidates for autosomal DNA testing—are unknown. This requires three activities:
    - Identifying the Calista's father's siblings
    - Tracing their descents to living people
    - Contacting the living people, obtaining their agreement to undertake autosomal-DNA testing, and supplying them with testing kits
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### DNA-Testing Activities for This Case

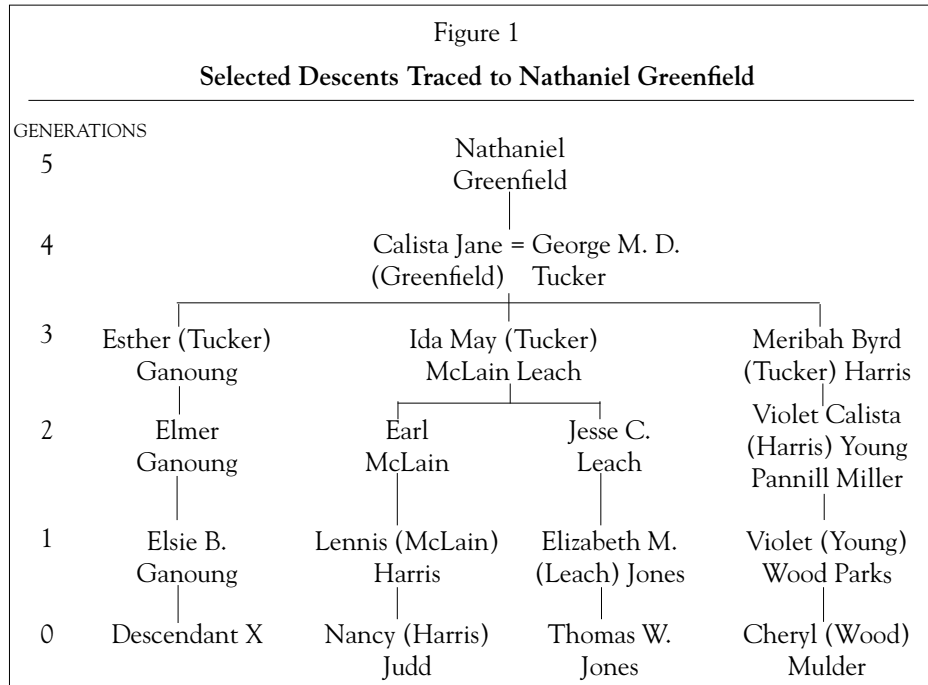
- Identifying living descendants of the known siblings, encouraging them to undertake DNA testing, and supplying them with testing kits
  - Identifying living descendants of the candidate grandparents, encouraging them to undertake DNA testing, and supplying them with testing kits
  - Ensuring that both pools contain sufficient numbers to yield matches at the 10–15 percent probability level
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1. International Society of Genetic Genealogy (ISOGG), *ISOGG Wiki* ([http://www.isogg.org/wiki/Autosomal\\_DNA\\_statistics](http://www.isogg.org/wiki/Autosomal_DNA_statistics) : viewed on 1 November 2015)), for "Autosomal DNA Statistics."

2. For 10 percent or greater, see "What is the probability that my relative and I share enough DNA for Family Finder to detect?," *FamilyTreeDNA* (<https://www.familytreedna.com/learn/autosomal-ancestry/universal-dna-matching/probability-relative-share-enough-dna-family-finder-detect/> : viewed on 1 November 2015). For about 15 percent, see "The Probability of Detecting Different Types of Cousins," *23andMe* (<https://customercare.23andme.com/hc/en-us/articles/202907230-The-probability-of-detecting-different-types-of-cousins> : viewed on 1 November 2015).

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## Selected Descendants of a Proved Ancestor; With Documented Relationships and a Partially Consenting Descendant



*Sources:* For Calista's parentage and husband, see the text.

For Esther, Ida, and Meribah's parents, see George M. D. Tucker, questionnaire 3—402, 1 August 1898; in George M. D. Tucker (Pvt., Cos. C and F, 3rd Mich. Cav., Civil War), pension no. S.C. 874,447, Case Files of Approved Pension Files 1861–1934 . . . , Civil War and Later Pension Files; Department of Veterans Affairs, Record Group 15; National Archives, Washington, D.C.

For Elmer's parents, see Kent Co., Mich., Returns of Marriages in the County of Kent for the Quarter Ending March 30 A.D. 1911, p. 11, Ganoung-Nelson, 25 February 1911; digital image, *FamilySearch* (<https://www.familysearch.org>) > Michigan, Marriages, 1868–1925 > 004209154 > image 394. For Elsie's, see 1920 U.S. census, Cook Co., Ill., population schedule, Chicago, Ward 24, enumeration district (ED) 1354, sheet 2B, dwelling 31, family 52, Elmer "Ganong" household; National Archives and Records Administration (NARA) microfilm T625, roll 335.

For Earl's parents, see Van Buren Co., Mich., Return of Births in the County of Van Buren for the Year Ending 31 December 1876, p. 256, no. 890, Earl McLain; digital image, *FamilySearch* > Michigan, Births, 1867–1902 > 004206431 > image 424. For Lennis's parents, see 1920 U.S. census, Sandusky Co., Ohio, pop. sch., Green Creek Twp., Clyde Village, ED 84, sheet 6A, dwell. 161, fam. 167, Earl McLain household; NARA microfilm T625, roll 1428.

For Jesse's parents, see Allegan Co., Mich., Return of Births in the County of Allegan for the Year Ending 31 December A.D. 1878, p. 7, no. 40, "Jessie D." Leach; digital image, *FamilySearch* > Michigan, Births, 1867–1902 > 004206453 > image 22. For Elizabeth's, see 1920 U.S. census, Sandusky Co., Ohio, pop. sch., Green Creek Twp., Clyde Village, ED 84, sheet 11B, dwell. 325, fam. 342, Jesse C. Leach household.

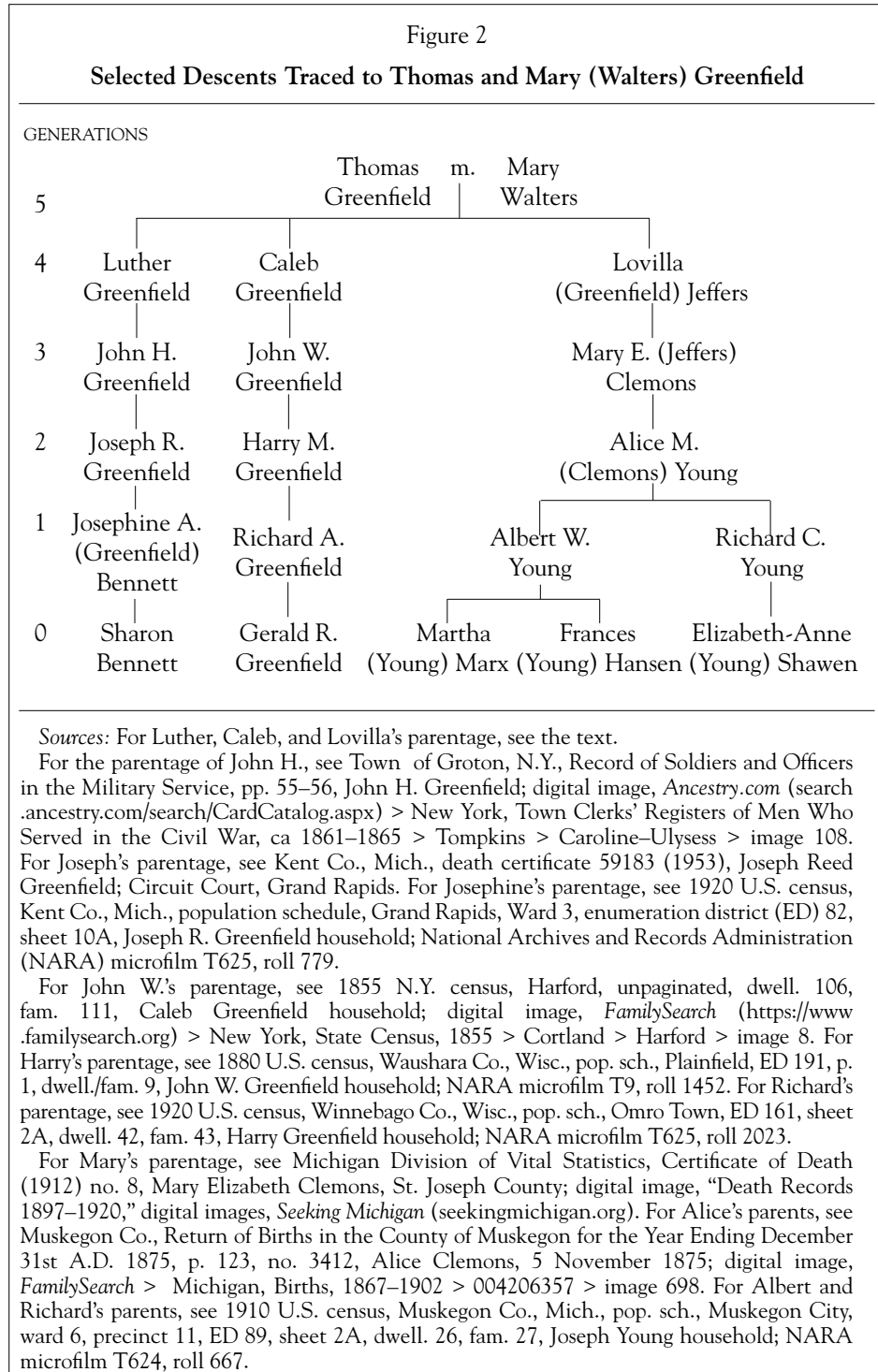
For Violet Harris's parents, see St. Clair Co., Mich., Return of Marriages in the County of St. Clair for the Quarter Ending June 30 A.D. 1922, record 17202, Pannill-Young, 14 June 1922; digital image, *FamilySearch* > Michigan, Marriages, 1868–1925 > 004210110 > image 352. For Violet Young's mother, see 1920 U.S. census, St. Clair Co., Mich., pop. sch., Port Huron, ward 4, precinct 8, ED 117, sheet 18B, dwell. 408, fam. 572, John Harris household; NARA microfilm T625, roll 795.

### Genealogical proof requires:

- Thorough research
- Source citations
- Evidence evaluation
- Evidence in agreement
- Clear explanation<sup>3</sup>

3. Board for Certification of Genealogists, *Genealogy Standards* (Nashville, Tenn.: Ancestry.com, 2014), 1–3.

## Selected Descendants of a Candidate Ancestor; With Documented Relationships



**Matches among  
(1) Descendants  
of a Proved  
Ancestor and  
(2) Descendants  
of a Candidate  
Ancestral  
Couple**

TRACED GREENFIELD ANCESTOR	DNA DONOR	LONGEST COMMON SEGMENT >7, IN CENTIMORGANS	SERIAL SNP COUNT	ESTIMATED GENERATIONS TO COMMON ANCESTORS
Nathaniel	Cheryl Mulder	7.6	717	7.4
Thomas	Elizabeth Shawen, through Lovilla	(chromosome 1)		
Nathaniel	Descendant X	14.9	1543	5.0
Thomas	Gerald Greenfield, through Caleb	(chromosome 2)		
Nathaniel	Thomas Jones	12.9	3469	5.1
Thomas	Martha Marx, through Lovilla	(chromosome 3)		
Nathaniel	Thomas Jones	12.9	3437	4.5
Thomas	Frances Hansen, through Lovilla	(chromosome 3)		
Nathaniel	Nancy Judd	14.9	672	5.0
Thomas	Sharon Bennett, through Luther	(chromosome 17)		
Nathaniel	Nancy Judd	14.3	1500	5.0
Thomas	Frances Hansen, through Lovilla	(chromosome 18)		
Nathaniel	Thomas Jones	14.4	3441	[shown in row 4]
Thomas	Frances Hansen, through Lovilla	(chromosome 18)		
Nathaniel	Descendant X	7.2	1616	7.5
Thomas	Frances Hansen, through Lovilla	(chromosome 18)		

Sources: "GEDmatch.Com Autosomal Comparison," on-request listings, *GEDmatch: Tools for DNA and Genealogy Research* (v2.gedmatch.com), kits A190412 (Shawen), A839038 (Hansen), M123945 (Marx), F202780 (Jones), F299963 (Mulder), F329609 (Greenfield), F329613 (Bennett), M115137 (Judd), and M201030 (Descendant X). *Ancestry.com* tested Hansen, Marx, and Shawen; *23AndMe* tested Descendant X and Judd; and *Family Tree DNA* tested Bennett, Mulder, Greenfield, and Jones.

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## What the Numbers Show

- Seven pairs of descendants inherited matching autosomal-DNA segments greater than 7.0 cM, indicating identical-by-descent matches.
  - Each match pairs a fifth-generation descendant of a proved ancestor with a fifth-generation descendant of a candidate couple for the proved ancestor's parents.
  - One pair shares identical segments on two chromosomes (Jones-Hansen) on chromosomes 3 and 18.
  - Two pairs (three donors) share an identical segment on chromosome 3.
  - Three pairs (four donors) share an identical segment on chromosome 18.
  - The MRCA's agree with a common ancestor within six generations, meaning the paired donors would be fifth-cousins or closer.
  - The percentages of matches—36.36 percent (4/11) of Nathaniel's descendants and 35.95 percent (5/7) of Thomas's) exceed the 10–15 percent probability of sharing enough autosomal DNA to detect a fifth cousin.
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## Follow-up Reasoning

- All relationships between proved ancestor Nathaniel and candidate ancestors Thomas and Mary can be ruled out, except for a son-parents relationship.
  - Other shared ancestors of the donors representing Nathaniel can be ruled out as a child of Thomas and Mary.
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## Answer-focused Research

- The father of Calista Jane Greenfield and her brother, who were born in New York in the late 1820s, was Nathaniel Greenfield, who was born in Herkimer County, New York, about 1810–12 and died probably in the 1840s.
  - Nathaniel's parents were Thomas and Mary (Walters) Greenfield.
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## Postscript: Citing DNA-Test Results

- All citations should lead readers to what the original researcher saw.
  - Citations should make it possible for readers to replicate the original researcher's results and conclusions.
  - With few exceptions, all citations should answer five basic questions:<sup>4</sup>
    1. What is the source (its name, description, and characteristics)?
    2. Who, or what organization, created the source?
    3. When did that person or organization create the source?
    4. Where can readers examine the source?
    5. Where within the source can readers find the information that the original researcher used?
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4. "Citation Elements," standard 4 in Board for Certification of Genealogists, *Genealogy Standards* (Nashville, Tenn.: Ancestry.com, 2014), 7–8.

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