

George Crook's Parentage: A Case Study

Indirect DNA Evidence of Biological Relationship and A Paper Trail Confirm George Crook's Parentage

GRANDFATHER CROOK CAME FROM ENGLAND

When this project began, the single known piece of relevant information was “Grandfather Crook came from England.”¹ Identifying the parents of George Crook, husband of Elizabeth (–?–) Crook, who resided in Goodhue County, Minnesota, from about 1860 until his death in 1909, required assembling documentary evidence, reconciliation of conflicting direct evidence, and indirect DNA evidence of biological relationship.

Ancestry Public Trees provide conflicting direct evidence of George Crook's parentage. Though often undocumented and error prone, they can offer clues to family composition that can be used to construct a research subject's genealogical definition.

GEORGE CROOK

George Crook lived in Goodhue County, Minnesota, nearly 50 years from about 1860 to 1909. Though many records reflect his residence there, none give evidence of his parentage.

It is not known where or when George married Elizabeth (–?–). No Goodhue County or Minnesota territorial or state record of their marriage exists.² It is likely they married before their arrival in Minnesota. If George immigrated to the U.S. through New York, it is probable he met Elizabeth in Connecticut, her state of birth, as he made his way west to Minnesota.

An early record documenting George and Elizabeth's arrival in Goodhue County is a 6 March 1860 deed to their slightly less than 100-acre farm.³ No evidence suggests this property was an inheritance from Elizabeth's family. The deed, in Elizabeth's name only, is one of several property transactions she initiated over the course of her married life. Appearing only as Elizabeth Crook, the land purchase document does not mention marital status and discharge of the mortgage filed 30 May 1862 by Elizabeth Crook and George Crook does not state their relationship.⁴

1. Elizabeth Katherine (Crook) Huff, granddaughter of George Crook, conversation with Dennis I. VanderWerff, Sacramento, California, summer 1960.

2. Lawrence H. Peterson, Clerk (District and County Court, Goodhue County, P.O. Box 42, Red Wing, Minnesota 55066) to Dennis I. VanderWerff, letter, 8 February 1978; author's files, Bakersfield, CA, 2017. Negative search for George Crook marriage record.

3. Goodhue County, Minnesota, Mortgage Record Book 7: 262, James McGinnis to Elizabeth Crook, mortgage record, 6 March 1860; County Recorder's Office, Red Wing.

4. Goodhue County, Minnesota, Miscellaneous Record Book 3: 13, Elizabeth Crook and George Crook, mortgage release, 30 May 1862; County Recorder's Office, Red Wing.

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George and Elizabeth Crooks [sic] resided in the “town of Leon” on 2 July 1860. George, born in England, was 25. Elizabeth, 27, was born in Connecticut.⁵ Though the 1860 census did not indicate household relationships, it is assumed George and Elizabeth were husband and wife.

George registered for the Civil War draft 21 August 1863. He was 30 years old, married, and a farmer. He gave his residence as Leon, Goodhue County, Minnesota, and his place of birth as England.⁶

ELIZABETH CROOK'S DEATH

Elizabeth was baptized 25 July 1872. A Church of the Redeemer baptismal record lists her parents as Robert and Jane Hannah.⁷ A search of local records found no candidates for Elizabeth's parents.

In a will dated 8 February 1886, Elizabeth named her husband, George, as sole executor. The will named their three children as Fleeta, a daughter, married to James H. Hine; Laura, daughter, married to Edward A. Dibble; and William J. Crook, a son.⁸ Elizabeth died a year and a half later, 25 July 1887, and was buried from Church of the Redeemer, 27 July 1887.⁹ A death notice and “Card of Thanks” were published in the *Cannon Falls Beacon*.¹⁰

Elizabeth's estate was admitted to probate 9 November 1887 and settled 8 December 1888. A final decree was issued and filed 18 June 1895.¹¹

5. “1860 United States Federal Census,” database with images, *Ancestry* (<http://SEARCH.ancestry.com/search/db.aspx?dbid=7667> : accessed 18 October 2017) > Goodhue > Leon > Image 2, dwelling no. 566, family no. 13, George Crooks [sic] household; citing NARA microfilm publication M653, roll 570; FHL film no. 803,570.

6. “U.S., Civil War Draft Registrations Records, 1863-1865,” database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=1666> : accessed 18 October 2017) > Minnesota > 2nd > Vol 1 of 4 > Image 83, line 19, entry for George Crook; citing NARA Consolidated Enrollment Lists, 1863-1865 (Civil War Union Draft Records), NAI 4,213,514, archive volume no. 1 of 4.

7. Church of the Redeemer (Cannon Falls, Minnesota), “Baptism and Burial Record, 1857-1914,” p. 58, Lizzie Crook adult baptism (1872); First Farmers and Merchants Bank safe deposit box, Cannon Falls.

8. “Minnesota, Wills and Probate Records, 1801-1925,” database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=9070> : accessed 17 October 2017) > Goodhue > Wills, Vol. A, 1860-1889 > Image 546, entry for Elizabeth Crook; citing Minnesota County District and Probate Courts, Red Wing.

9. Church of the Redeemer (Cannon Falls, Minnesota), “Baptism and Burial Record, 1857-1914,” p. 114, Elizabeth Crook wife of George Crook burial (1887); First Farmers and Merchants Bank safe deposit box, Cannon Falls.

10. “Cannon Falls Beacon,” *Cannon Falls Beacon*, 29 July 1887, p. 1, col. 4; citing microfilm, *Cannon Falls Beacon*, reel 1 October 1887–25 April 1890, Cannon Falls Public Library, Cannon Falls, Minnesota. Also, “Card of Thanks,” *Cannon Falls Beacon*, 5 August 1887, p. 1, col. 3; citing microfilm, *Cannon Falls Beacon*, 1 October 1887–25 April 1890, Cannon Falls Public Library, Cannon Falls, Minnesota.

11. Goodhue County, Minnesota, Deed Book X4: 26-28, estate of Elizabeth Crook, final decree, 18 June 1895; County Recorder's Office, Red Wing.

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GEORGE CROOK'S LATER YEARS

In the years following Elizabeth's death, George continued to farm with the help of his son, William. Elfleeda and her family resided in Kingston Twp., Meeker County, Minnesota, in 1900, where James farmed.¹² Laura and her family resided in Stanton Twp., Goodhue County, Minnesota, where Edward continued to work the Dibble family farm.¹³ William married Hattie May Hine 17 October 1895.¹⁴

William and his family lived with George in 1900. Though the census that year indicated William owned the farm, no land records give evidence that George sold his land or gave it to William. George, a widower and retired farmer, was born in England in February 1835 and arrived in the U.S. in 1849. His U.S. citizenship status of "Pa" indicated he filed first papers (Declaration of Intention). The search for citizenship papers produced negative results.¹⁵

George had lived in Minnesota for 36 years, consistent with information from the 1895 Minnesota State Census confirming his earliest known residence there.¹⁶ His reported birthdate of February 1835 and immigration year of 1849 suggests George was 14 when he landed in the U.S. where he lived for ten years before arriving in Minnesota.

It is probable that George came to Minnesota through New York, his westward journey taking him through Connecticut where he may have met and married Elizabeth. A search of New York ship passenger arrival lists for George Crook, born in England, 1833-37, found four candidates all of whom arrived 1854-1912. See table 1.

Neither George Crook (b. abt. 1836) nor George L. Crook (n.d.) is a likely candidate for the case study subject as each arrived in New York several years after the case study subject established residence in Goodhue County, Minnesota. Of Irish ethnicity/nationality, George Crook (b. abt. 1834) is an unlikely candidate.

12. 1900 United States Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7602> : accessed 20 October 2017) > Minnesota > Meeker > Kingston > District 0112 > Image 16, dwelling no. 151, family no. 151, James Hine household; citing NARA microfilm publication T623, roll 775; FHL film no. 1,240,775.

13. 1900 United States Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7602> : accessed 20 October 2017) > Minnesota > Goodhue > Stanton > District 0055 > Image 6, dwelling no. 55, family no. 56, Edward Dibble household; citing NARA microfilm publication T623, roll 764; FHL film no. 1,240,764.

14. Goodhue County, Minnesota, marriage certificate (1895), Crook-Hine; District Court Clerk's Office, Red Wing.

15. "1900 United States Federal Census 1900," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7602> : accessed 22 July 2016) > Minnesota > Goodhue > Stanton > District 0055 > Image 6, dwelling no. 54, family no. 55, William J. Crook; citing National Archives microfilm publication T623, roll 764; FHL Film No. 1,240,764. Kathleen W. Hinckley, *Your Guide to the Federal Census for Genealogists and Family Historians* (Cincinnati, OH: Betterway Books, 2002) 13. "Minnesota Naturalization Records Index, 1854-1957," database, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=3826> accessed 9 August 2018) search for George Crook returned no records.

16. In a will dated 8 February 1886, Elizabeth named her husband, George, as sole executor.

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George Crook (b. abt. 1835), age 19, arrived in 1854 with a likely family group headed by Hannah Crook, age 46. Traveling with George and seven other Crook children, Hannah may be a potential candidate for George's mother.

Table 1
George Crook
New York Ship Passenger Arrivals, 1854-1912

Name	Arrival Date	Birth Year	Port of Departure	Ethnicity/ Nationality	Ship Name
George Crook	5 Jan. 1854	abt. 1835	Liverpool, England	English	Orient ^a
George Crook	26 Apr 1855	abt. 1834	Liverpool, England	Irish	Webster ^b
George Crook	25 Apr. 1865	abt. 1836	Liverpool, England, Queenstown, Ireland	English	City of Washington ^c
George L. Crook	28 Jun. 1912	Not stated	Liverpool, England	Not stated	Mauretania ^d

^a "New York, Passenger Lists, 1820-1957," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7488> : accessed 14 October 2017) > Roll > M237, 1820-1957 > Roll 116 > Image 131; entry for George Crook; citing National Archives Microfilm Publication, M237, roll 135, list no. 905.

^b "New York, Passenger Lists, 1820-1897," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7488> : accessed 14 October 2017) > Roll > M237, 1820-1957 > Roll 151 > Image 398; entry for George Crook, line 245; citing National Archives Microfilm Publication, M237, roll 135, list no. 248.

^c "New York, Passenger Lists, 1820-1897," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7488> : accessed 14 October 2017) > Roll > M237, 1820-1957 > Roll 250 > Image 395; entry for George Crook, line 20; citing National Archives Microfilm Publication, M237, roll 135, list no. 281.

^d "New York, Passenger Lists, 1820-1897," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7488> : accessed 14 October 2017) > Roll > T715, 1897-1957 > Roll 1889 > Image 665; entry for George L. Crook, line 8; citing National Archives Microfilm Publication, T715, roll 1,889.

GEORGE CROOK'S DEATH

A 4-tier granite gravestone marks the graves of Elizabeth and George Crook in the Cannon Falls Community Cemetery, Cannon Falls, Goodhue County, Minnesota. The stone's inscription states

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“George Crook born Feb. 3, 1835[,] died Dec. 23, 1909. Elizabeth, his wife, died July 26, 1887, [age] 53 years[,] Gone but not forgotten.”¹⁷

George died intestate 23 December 1909. The final decree for the probate of his estate stated he “died in said [Goodhue] county.”¹⁸ Searches of Goodhue County and Minnesota state records found no evidence of death recorded for George Crook.¹⁹ In a notice appearing in the *Cannon Falls Beacon*, 31 December 1909, Mrs. E. A. (Laura) Dibble, George’s daughter, “announced the death of her father George Crooks [sic] in California.”²⁰

George was buried from Church of the Redeemer, 29 December 1909. Age 74, he was a baptized and confirmed communicant of the church, who resided in “Folsom, California, near Sacramento,” at the time of his death.²¹

George died in Orangevale, Sacramento County, California. Death certificate informant, Mrs. J. H. (Elfleeda (Crook) Hine), George’s elder daughter, stated the deceased was born 3 February 1835. He was a farmer and the son of William and Hannah (Johnson) Crook, all born in England. The cause of death was “opium poisoning taken as an overdose accintally [sic].”²² At the time of his death, George had lived in California four years. He may have gone to California after June 1905, the date of the Minnesota state census that placed him in the household of Laura and Edward Dibble. Death owing to opium poisoning suggests George may have suffered with arthritis or rheumatism and removed to California to escape the brutal Minnesota winters.²³

17. *Find A Grave*, database with images (<http://www.findagrave.com> : accessed 22 July 2016), memorial 91939088, George Crook (1835-1909), Cannon Falls Community Cemetery, Cannon Falls, Goodhue, Minnesota; memorial created by Mookie; gravestone photo by Dave Vangsness. Also, *ibid.* memorial 91939089, Elizabeth Crook (1834-1887).

18. Goodhue County, Minnesota, Deed Book D6: 391, estate of George Crook, final decree, 11 October 1910; County Recorder’s Office, Red Wing.

19. Joanne Spindler, Deputy Registrar (Minnesota Department of Health, 717 S.E. Delaware St., Minneapolis, MN 55440) to Dennis I. VanderWerff, letter, 22 February 1978; author’s files, Bakersfield, CA, 2017. “Minnesota People Search,” database with images, Minnesota Historical Society (<http://www.mnhs.org/search/people> : accessed 20 October 2017). “Minnesota Death Index, 1908-2002, database, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7316> : accessed 20 October 2017). Negative searches for George Crook, Minnesota state and county death records.

20. “George Crooks [sic],” *Cannon Falls Beacon*, 31 December 1909, p. 7, col. 6; citing microfilm, Cannon Falls Beacon, reel 1-31 December 1909, Cannon Falls Public Library, Cannon Falls, Minnesota.

21. Church of the Redeemer (Cannon Falls, Minnesota), “Baptism and Burial Record, 1857-1914,” p. 114, George Crook burial (1909); First Farmers and Merchants Bank safe deposit box, Cannon Falls.

22. California State Board of Health, original certificate of death, no. 9-030838 (1909), George Crook; Bureau of Vital Statistics, Sacramento.

23. “Minnesota, Territorial and State Censuses, 1849-1905,” database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=1058> : accessed 20 October 2017) > 1905 > Goodhue > Image 348, [line no. 30], Edward Dibble household; citing Minnesota Territorial Census Schedules, 1865-1905, Minnesota Historical Society microfilm, reels 1-47.

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Between 1900 and 1910, the James and Elfleeda Hine family relocated to California where they resided in Mississippi Twp., Sacramento County, California. James was employed as a fruit farmer.²⁴ William and his family followed and were neighbors of the Hine family.²⁵

EVIDENCE SUMMARY

- The probate final decree of George's estate provides direct evidence of George's death in Goodhue County, Minnesota.
- A notice published in *The Cannon Falls Beacon* provides direct evidence of George's death in California.
- A Church of the Redeemer burial record provides direct evidence of George's death in California.
- A California death certificate confirms George's death in California and provides direct evidence of George's parentage.
- Information from the California death certificate suggests Hannah (Johnson) Crook may be Hannah Crook who arrived in New York with George Crook, 5 January 1854.

WILLIAM AND HANNAH (JOHNSON) CROOK

William Crook and Hannah Johnson were married 13 July 1828 in Leckhampstead, Buckingham, England.²⁶ William was an agricultural laborer. They had eleven children all of whom were baptized. See table 2.

24. "1910 United States Federal Census," database with images, Ancestry (<http://search.ancestry.com/search/db.aspx?dbid=7884> : accessed 20 October 2017) > California > Sacramento > Mississippi > District 0088 > Image 6, dwelling no. 57, family no. 57, James Hine household; citing NARA microfilm publication T624, roll 92; FHL film no. 1,374,105.

25. *Ibid.*, dwelling 61, family no 61, William Crook household.

26. William Crook and Hannah Johnson Marriage Record, 13 July 1828, Leckhampstead, Buckinghamshire, England, page 21, No. 62; FHL Film 1,042,388, Item 11.

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Table 2 William and Hannah Crook Children's Baptisms Recorded in the "Register of Baptisms in the Parish of Leckhamstead [<i>sic</i>] in the County of Buckingham"		
No.	Child's Name	Baptism Date
i.	Anne Crook ^a	27 September 1829
ii.	Mary Ann Crook ^b	13 February 1831
iii.	John Crook ^c	30 June 1833
iv.	George Crook ^d	22 February 1835
v.	Eliza Crook ^e	7 May 1837
vi.	William Crook ^f	2 June 1839
vii.	Eli Crook ^g	26 September 1841
viii.	Elizabeth Crook ^h	4 August 1844
ix.	David Crook ⁱ	1 November 1846
x.	Emma Crook ^j	11 February 1849
xi.	Leahannah Crook ^k	4 May 1851
<p>^a Anne Crook Baptismal Record, 27 September 1829, Leckhampstead, Buckinghamshire, England, page 33, No. 260; FHL Film 1,042,388, Item 10.</p> <p>^b Mary Ann Crook Baptismal Record, 13 February 1831, Leckhampstead, Buckinghamshire, England, page 35, No. 322; FHL Film 1,042,388, Item 10.</p> <p>^c John Crook Baptismal Record, 30 June 1833, Leckhampstead, Buckinghamshire, England, page 41, No. 322; FHL Film 1,042,388, Item 10.</p> <p>^d George Crook Baptismal Record, 22 February 1835, Leckhamstead, Buckinghamshire, England, p 44, No. 352; FHL Film 1,042,388, Item 10.</p> <p>^e Eliza Crook Baptismal Record, 7 May 1837, Leckhampstead, Buckinghamshire, England, page 50, No. 393; FHL Film 1,042,388, Item 10.</p> <p>^f William Crook Baptismal Record, 2 June 1839, Leckhampstead, Buckinghamshire, England, page 53, No. 423; FHL Film 1,042,388, Item 10.</p> <p>^g Eli Crook Baptismal Record, 26 September 1841, Leckhampstead, Buckinghamshire, England - page 58, No. 463; FHL Film 1,042,388, Item 10.</p> <p>^h Elizabeth Crook Baptismal Record, 4 August 1844, Leckhampstead, Buckinghamshire, England, page 66, No. 523; FHL Film 1,042,388, Item 10.</p> <p>ⁱ David Crook Baptismal Record, 1 November 1846, Leckhampstead, Buckinghamshire, England, page 71, No. 564; FHL Film 1,042,388, Item 10.</p> <p>^j Emma Crook Baptismal Record, 11 February 1849, Leckhampstead, Buckinghamshire, England, page 71, No. 597; FHL Film 1,042,388, Item 10.</p> <p>^k Leahannah Crook Baptismal Record, 4 May 1851, Leckhampstead, Buckinghamshire, England, page 80, No. 635; FHL Film 1,042,388, Item 10.</p>		

Table 3 presents the William Crook family composition, stages of immigration to the U.S., and confirms Hannah and George Crook are the same Hannah and George Crook cited in Table 1.

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Table 3 William and Hannah Crook Family Composition				
England Census		Immigration to U.S.		
6 June 1841 ^a	30 March 1851 ^b	Arrival 22 March 1852 ^c	Arrival 9 July 1852 ^d	Arrival 5 January 1854 ^e
William, M, 35	William, Head, Married, 45, Agricultural Labourer		William Crook, 45, Labourer	
Hannah, F, 30	Hannah, Wife, Married,			Hannah Crook, 46, Laborer
Anne, F, 11 ^f		George Scott and Ann (Crook) Scott		
Mary, F, 10 ^g				
John, M, 7	John, Son, Unmarried, 17, Agricultural Labourer		John, 18, Labourer	
Geo., M, 6	George, Son, Unmarried, 16, Ag. Lab.			George Crook, 18, Laborer
Eliza, F, 4	Eliza, Daughter, 15, Lace Maker			Eliza Crook, 16, Laborer
William, M, 2	William, Son, 10, Ag. Lab.			William Crook, 14, Laborer
	Eli, Son, 9, Scholar			Eli Crook, 11, Laborer
	Elizabeth, Daughter, 6, Scholar			Elizabeth, 7, Laborer

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Table 3 William and Hannah Crook Family Composition				
England Census		Immigration to U.S.		
6 June 1841 ^a	30 March 1851 ^b	Arrival 22 March 1852 ^c	Arrival 9 July 1852 ^d	Arrival 5 January 1854 ^e
	David, Son, 5			David, 9, Laborer
	Emma, Daughter, 2			Emma, 5, Laborer
	Leahannah, Daughter, 1 mo.			Leana, 3
<p>^a“1841 England Census,” database with images, <i>Ancestry</i> (https://search.ancestry.com/search/db.aspx?dbid=8978 ; accessed 28 February 2018) > Buckinghamshire > Leckhampstead > District 3 > image 6; William Crook household, Church End, Leckhampstead; citing Public Record Office, HO107, piece 44, folio 8, page 8; GSU roll no. 241,212.</p> <p>^b“1851 England Census,” database with images, <i>Ancestry</i> (https://search.ancestry.com/search/db.aspx?dbid=8860 : accessed 28 February 2018) > Buckinghamshire > Leckhampstead > 7 > image 4; William Crook household, 6 Leckhampstead, Leckhampstead; citing Public Record Office, HO107, piece 1,724, folio 75, page 3; GSU roll: 193,633.</p> <p>^c“New York, Passenger Lists, 1820-1957,” database with images, <i>Ancestry</i> (http://search.ancestry.com/search/db.aspx?dbid=7488 : accessed 14 October 2017) > Roll > M237, 1820-1957 > Roll 110 > Image 337; entry for George Scott; citing National Archives Microfilm Publication, M237, roll 110, list no. 218</p> <p>^d“New York, Passenger Lists, 1820-1957,” database with images, <i>Ancestry</i> (http://search.ancestry.com/search/db.aspx?dbid=7488 : accessed 14 October 2017) > Roll > M237, 1820-1957 > Roll 116 > Image 131; entry for George Crook; citing National Archives Microfilm Publication, M237, roll 116, list no. 905.</p> <p>^e“New York, Passenger Lists, 1820-1957,” database with images, <i>Ancestry</i> (http://search.ancestry.com/search/db.aspx?dbid=7488 : accessed 14 October 2017) > Roll > M237, 1820-1957 > Roll 135 > Image 336; entry for Hannah Crook; citing National Archives Microfilm Publication, M237, roll 135, list no. 16.</p> <p>^fGeorge Scott and Ann Crook Marriage Record, 5 January 1852, Leckhampstead, Buckinghamshire, England, page 57, No. 170; FHL Film 1,042,388, Item 11.</p> <p>^gSands Read and Mary Ann Crook Marriage Record, 24 October 1850, Leckhampstead, Buckinghamshire, England, page 55, No. 163; FHL Film 1,042,388, Item 11. Sands and Mary Ann (Crook) Read remained in England.</p>				

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Country wide civil registration of births, marriages and deaths in England and Wales began 1 July 1837.²⁷ Births of the five eldest Crook children occurred before civil registration was required. William's, Eli's, David's, and Emma's births were registered.²⁸ Elizabeth's and Leahannah's were not.²⁹

Baptism and census records provide direct evidence of relationship; but, they do not provide proof. It is not unusual for the child of a family relative or a foundling to be taken in and raised as a couple's own child. Absence of civil registration of birth raises the question, is George Crook the natural (biological) child of William and Hannah Crook? DNA testing of a group of William and Hannah's descendants, analysis of DNA evidence, and correlation with documentary evidence make a compelling case for paternity.

DNA TESTING PLAN

DNA samples from George's descendants compared with samples from descendants of George's siblings help identify William and Hannah as their common ancestor. Five descendants of George and six descendants of five of George's siblings were identified as a focus group.

Identifying William and Hannah as parents of George and his siblings involved several processes:

1. The eleven descendants provided samples for autosomal DNA testing at AncestryDNA and for comparison at *GEDmatch.com*.³⁰
2. Construction of a family tree tracing descents of the focus group of William and Hannah's descendants and confirming their parentage.
3. Use of GEDmatch.com, One-to-One match, Matching Segments, and Triangulation tools.
4. Use of Genome Mate Pro,³¹ a tool for managing, organizing, and comparing autosomal DNA data from a variety of sources (e.g., 23 & Me, AncestryDNA, Family Tree DNA, GEDmatch.com), and for identifying common ancestors.

27. "England & Wales, Civil Registration Birth Index, 1837-1915," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=8912>; accessed 12 August 2018); citing "About England & Wales, Civil Registration Birth Index, 1837-1915."

28. "England & Wales Births, 1837-2006," database with images, *Find My Past* (<https://search.findmypast.com/record?id=BMD/B/1839/2/AK/000702&parentid=BMD/B/1839/2/AK/000702/011>; accessed 12 August 2018), entry for William Crook; *Ibid.*, (<https://search.findmypast.com/record?id=BMD/B/1841/3/AL/000669&parentid=BMD/B/1841/3/AL/000669/018>, entry for Eli Crook; *Ibid.*, (<https://search.findmypast.com/record?id=BMD/B/1846/3/AG/000756&parentid=BMD/B/1846/3/AG/000756/003>, entry for David Crook; *Ibid.*, (<https://search.findmypast.com/record?id=BMD/B/1849/1/AH/000835&parentid=BMD/B/1849/1/AH/000835/017>.entry for Emma Crook.

29. "England & Wales Births, 1837-1915," database with images, *Find My Past* (<https://www.findmypast.com/>; accessed 12 August 2018), negative search for Elizabeth Crook; also, for Leahannah Crook.

30. *GEDmatch.com* (<https://www.gedmatch.com/> : accessed 15 August 2018).

31. Genome Mate Pro: A Tool for Managing DNA Comparisons (<https://www.getgmp.com/> : 15 August 2018).

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5. Use of Visual Phasing,³² a process by which the DNA of a set of siblings is assigned to their four grandparents using identified recombination points, without requiring the testing of either the parents or grandparents.

DNA TESTING

George's five descendants (Margaret, Mary, Clayton, Dennis, Shirley) and the six descendants of George's siblings (Mary Ann, Eliza, William, Elizabeth, and David) agreed to participate in the study. All used AncestryDNA kits.³³ Lineage of the six siblings is presented in Figures 1 and 2. Descendants of two of the Crook siblings (Anne and John) could not be located; one (Emma) declined to participate in the study; and two (Eli and Leahannah) died without issue. Elizabeth's descendant chose not to be identified by name.

Third cousins descend from a pair of second great-grandparents and are expected to share 53.13 cMs, on average, but actual amounts range between 334 cMs and 0 cMs with 89 cMs being the average.³⁴ Fourth cousins descend from a pair of third great-grandparents and are expected to share 13.28 cMs, on average, but actual amounts range between 127 cMs and 0 cMs with 35 cMs being the average.³⁵ The centiMorgan is a measure of genetic linkage based on recombinant frequency to predict a relationship between test takers.³⁶

AncestryDNA raw data were uploaded to GEDmatch.com, a third-party application used to compare autosomal DNA (atDNA) test results from several DNA testing companies.³⁷ Among other statistical data, *GEDmatch* reports the total number of shared centimorgan (cMs) on autosomal and X-chromosome segments larger than 7 cMs.

Genome Mate Pro facilitated triangulation of DNA data from aggregated sources (as noted above). In autosomal DNA testing, triangulation is the process of reviewing pedigree charts of people who match on the same autosomal DNA segment leading to identification of a potential common ancestor.³⁸

Visual Phasing is a powerful tool used to identify the likely ancestral line shared with a DNA match. The triad of GEDmatch.com, Genome Mate Pro, and Visual Phasing used together, form the basis of a chromosome mapping process to rule out the possibility that a DNA match is not in another more distant line which has not been researched.

32 "DNA- Visual Phasing Spreadsheet – V2.3a Official.xlsm," The Visual Phasing Work Group (<https://www.facebook.com/groups/visualphasing/files/> : 15 August 2018).

33. AncestryDNA (dna.ancestry.com/).

34. "Autosomal DNA Statistics," International Society of Genetic Genealogy Wiki (https://isogg.org/wiki/Autosomal_DNA_statistics). Also, "Visualizing Data From the Shared cM Project," <https://thegeneticgenealogist.com/2015/05/29/visualizing-data-from-the-shared-cm-project/> : accessed 12 August 2018).

35. "The Shared cM Project 3.0 tool v4," DNAPainter: Tools (<https://dnainter.com/tools/sharedcmv4>).

36. "CentiMorgan," International Society of Genetic Genealogy Wiki (<https://isogg.org/wiki/CentiMorgan> : accessed 12 August 2018).

37. GEDmatch, For example, 23andMe.com, AncestryDNA.com, Family Tree DNA, My Heritage, and others.

38. "Triangulation," International Society of Genetic Genealogists Wiki (<https://isogg.org/wiki/Triangulation> : accessed 15 August 2018).

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DNA EVIDENCE AND ANALYSIS

Chromosomes providing evidence of matches between third and fourth cousins were visually phased using the DNA Visual Phasing Spreadsheet for a group of three full (VanderWerff) siblings: the author, his sister, Gaynl, and his brother, Gary. See figure 1 “Note.” Figures 1 and 2 were used to rule out the possibility of multiple common ancestors. GEDmatch start and end points to mark overlapping cousin segments with the three (VanderWerff) siblings’ grandparents allowed assignment of Crook cousin segments to the (VanderWerff) siblings’ paternal (Crook) chromosome. See table 4.

Tables 5 through 8 present relationship comparisons between George Crook’s descendants and the six DNA donor descendants of George Crook’s siblings. The DNA of one of George’s descendants (Shirley) did not provide evidence of detectable amounts of DNA shared with descendants of George’s siblings.

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Table 4
Autosomal DNA Test Results
George Crook Siblings Traced to William and Hannah (Johnson) Crook Descendants

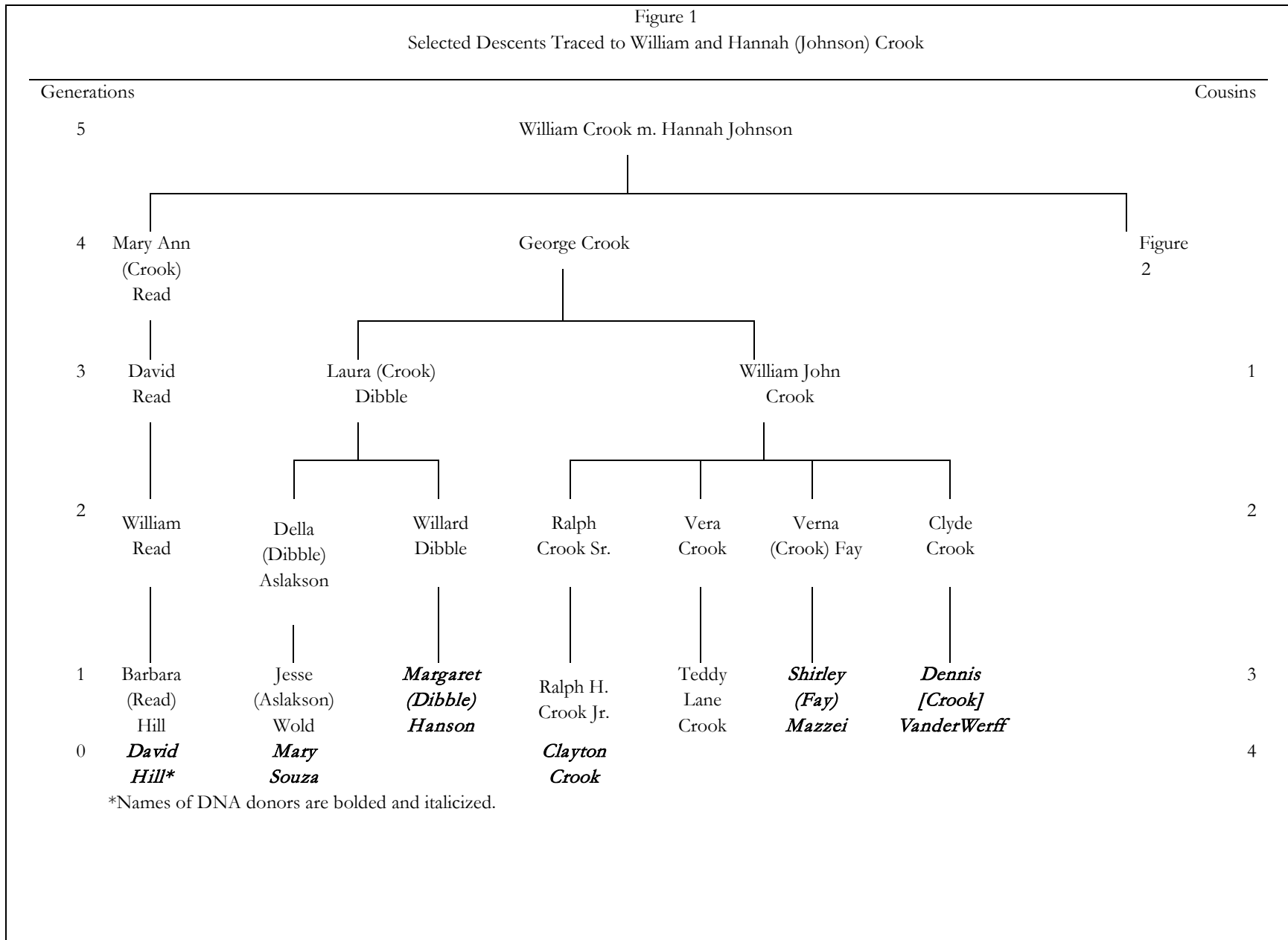
DNA DONOR [CROOK SIBLING]	MARY (WOLD) SOUZA			HELEN (DIBBLE) HANSON			CLAYTON CROOK			DENNIS VANDERWERFF		
	CHR (CMS)	START	STOP	CHR (CMS)	START	STOP	CHR (CMS)	START	STOP	CHR (CMS)	START	STOP
Brian Japuntich [William Crook]	1 (10.6)	196.6	203.7	11 (13.4)	13.0	21.1	14 (22.5)	79.9	95.2	8 (18.4)	119.5	129.6
Myron Nadolski [David Crook]	12 (17.2)	118.4	127.4	3 (12.5)	25.4	35.7	(4) (21.2)	89.2	114.2	2 (30.4)	191.7	220.4
	18 (7.3)	13.4	21.5				12 (32.3)	93.6	117.0	3 (12.7)	25.3	35.7
										7 (12.5)	153.8	158.7
Olive Thomas [Eliza (Crook)]	11 (14.3)	108.0	118.5	11 (14.3)	108.0	118.5				15 (23.5)	77.1	91.7
David Hill [Mary Ann (Crook) Read]				11 (38.9)	12.0	41.4	10 (15.4)	113.9	122.8	12 (22.5)	118.8	128.6
				16 (11.8)	51.5	57.6	12 (25.0)	117.2	128.5	16 (11.4)	83.9	88.7
							14 (27.9)	34.9	68.6			
Kathryn Paine [David Crook]				20 (11.8)	9.6	15.7	15 (24.8)	18.3	31.0			

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Table 4
Autosomal DNA Test Results
George Crook Siblings Traced to William and Hannah (Johnson) Crook Descendants

DNA DONOR [CROOK SIBLING]	MARY (WOLD) SOUZA			HELEN (DIBBLE) HANSON			CLAYTON CROOK			DENNIS VANDERWERFF		
	CHR (CMs)	START	STOP	CHR (CMs)	START	STOP	CHR (CMs)	START	STOP	CHR (CMs)	START	STOP
							20 (12.6)	9.3	15.7			
<p><i>Sources:</i> "GEDmatch.Com Autosomal Comparison," one-to-one comparison, <i>GEDmatch: Tools for DNA and Genealogy Research</i> (gedmatch.com), kits A106747 (David Hill), A287698 (Brian Japuntich), A512246 (Clayton Crook), A638674 (Margaret (Dibble) Hanson) A641966 (Mary (Wold) Souza), A711733 (Myron Nadolski), A717757 (Kathryn Paine), A858763, (Dennis VanderWerff), A936811 (Olive Glendenning Thomas). <i>AncestryDNA</i> (ancestry.com) tested all kits.</p>												

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George Crook's Parentage: A Case Study

Figure 1

Selected Descents Traced to William and Hannah (Johnson) Crook

Sources:

For Mary Ann Crook Read's and George Crook's parentage, see the text.

For the parentage of David Read, see "Northamptonshire, England, Church of England Baptisms, 1813-1912," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=9200> : accessed 10 October 2017) > Wicken > Parish Registers > 1863-1912 > Image20, entry for David Read (1870); citing Northamptonshire Anglican Parish Registers and Bishop's and Bishop's Transcripts. Textual records. Northamptonshire Record Office, Northampton, England. For William's parentage, see "Northamptonshire, England, Church of England Baptisms, 1813-1912," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=9200> : accessed 10 October 2017) > Wicken > Parish Registers > 1863-1912 > Image44, entry for William Read; citing Northamptonshire Record Office, Parish Registers, Northampton, England; Reference Numbers: 364P/72. For Barbara's parentage, see "1881 England Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7572> : accessed 10 October 2017) > London > Marylebon > Rectory > District 1a > Image68, entry for William Read household; citing The National Archives, RG11, Piece, 141, Folio 37, Page 67; GSU roll 1,341,031.

For parentage of Laura Crook, see "1870 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7163> : accessed 10 October 2017) > Minnesota > Goodhue > Cannon Falls > Image7, dwelling 39, family 42, George Crook household; citing NARA microfilm publication T132, roll 4; FHL film no.: 830,424. For Della's and Willard's parentage, see "1900 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7602> : accessed 10 October 2017) > Minnesota > Goodhue > Stanton > District 0055 > Image6, dwelling 55, family 56, Edward Dibble household; citing NARA microfilm T623, roll 764; FHL film no.: 1,240,764. For Jessie's parentage, see "1920 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=6061> : accessed 10 October 2017) > Minnesota > Hennepin > Minneapolis Ward 13 > District 0245 > Image44, dwelling 480, family 536, John S. Aslakson household; citing NARA microfilm publication T625, roll 838. For Mary (Wold) Souza's parentages, see "Public Member Tree," database, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=1030> : accessed 9 August 2018) > search "Albert Woodrow Wold" > Wold Family Tree > Alfred Woodrow Wold profile. Margaret Helen Dibble's parentage, see "1930 United States Federal Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=6224> : accessed 9 August 2018) > Minnesota > Goodhue > Stanton > District 0027 > Image 9, dwelling 99, family 100, Willard A. Dibble household; citing NARA microfilm publication T626, roll 1,087; FHL film no. 2,340,822.

For parentage of William John Crook, see Goodhue County, Minnesota, birth certificate, William John Crook (1873); District Court Clerk's Office, Red Wing. For parentage of Ralph Crook Sr., see "1900 United States Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=7602> : accessed 9 August 2018) > Minnesota > Goodhue > Stanton > District 0055 > Image 6, dwelling 54, family 55, William J. Crook household; citing NARA microfilm publication T623, roll 764; FHL film no. 1,240,764. For Ralph Jr.'s parentage, see "1940 United States Federal Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=2442>: accessed 9 August 2018) > California > Sacramento > Sacramento > 34-69 > Image 19, house number 3219 4th Avenue, family 234, Harry R. Crook household; citing NARA microfilm publication T627, roll 283; FHL film no. 5,456,348. For Clayton Crook's parentage, see "Public Member Tree," database, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=1030> : accessed 9 August 2018) > search "Ralph H. Crook, born 1922" > Crook Family Tree > Ralph H. Crook profile. For Vera Crook's parentage, see "1910 United States Federal Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=7884>: accessed 9 August 2018) > California > Sacramento > Mississippi > District 0088 > Image 6, dwelling 61, family 61, William Crook household; citing NARA microfilm publication T624, roll 92; FHL no. 1,374,105. For Teddy Crook's parentage, see "1940 United States Federal Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=2442>: accessed 9 August 2018) > California > Sacramento > Sacramento > 34-71 > Image 19, house number 2959 Sacramento Blvd., family 215, Hattie May Marshall household; citing NARA microfilm publication T627, roll 283; FHL film no. 5,456,348. For Marcia Crook Young's parentage, see "Public Member Tree," database, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=1030> : accessed 9 August 2018) > search "Teddy Lane Crook" > Crook Family Tree > Teddy Lane

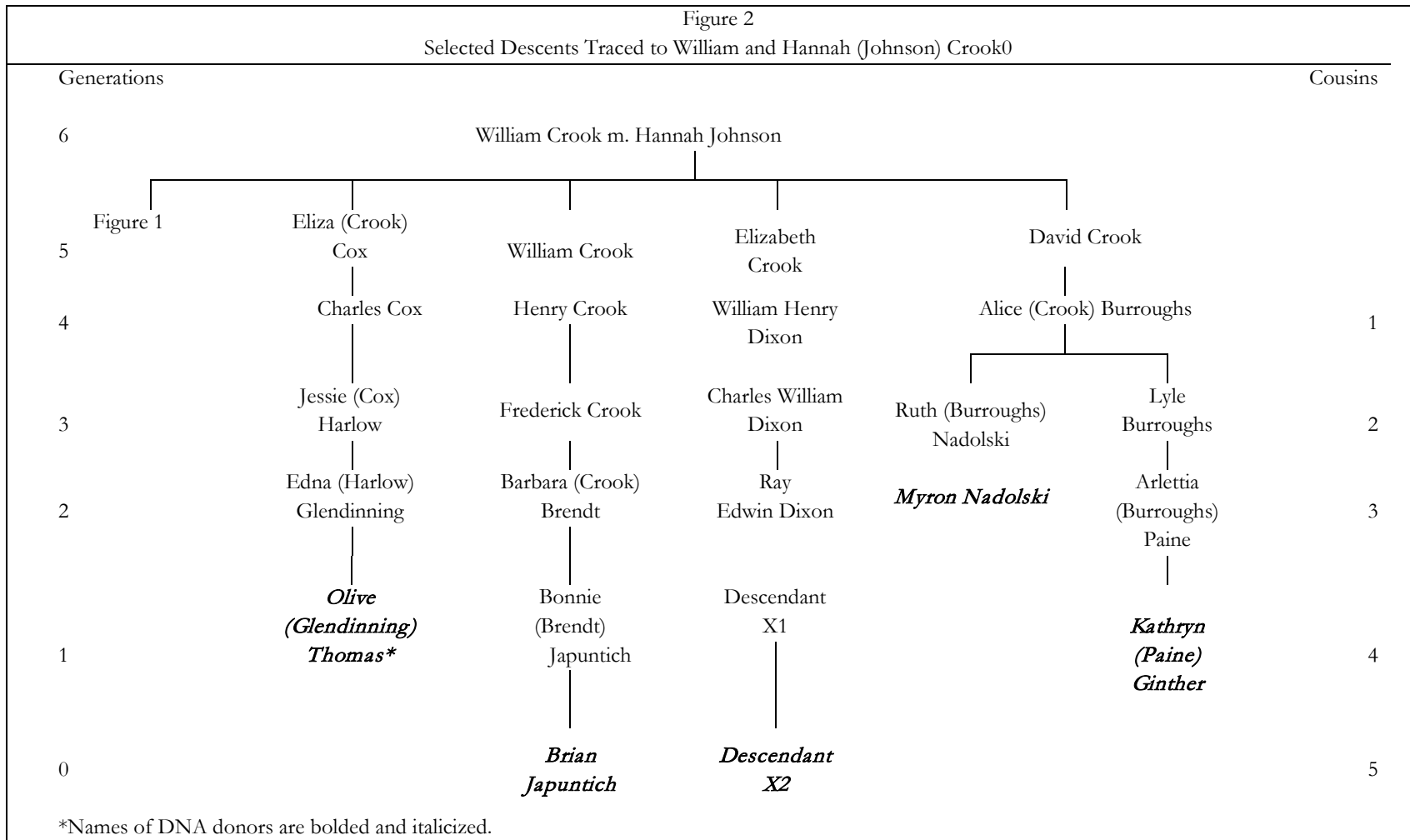
George Crook's Parentage: A Case Study

Figure 1

Selected Descents Traced to William and Hannah (Johnson) Crook

Crook profile. For Verna (Crook) Fay's parentage, see "1910 United States Federal Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=7884>: accessed 9 August 2018) > California > Sacramento > Mississippi > District 0088 > Image 6, dwelling 61, family 61, William Crook household; citing NARA microfilm publication T624, roll 92; FHL no. 1,374,105. For Shirley (Fay) Mazzei's parentage, see "1940 United States Federal Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=2442>: accessed 9 August 2018) > California > Sonoma > Santa Rosa > 49-48 > Image 35, house number 2174 Humboldt, family 286, Theodore J. Fay household; citing NARA microfilm publication T627, roll 350; FHL film no. 5,456,348. For Clyde Crook's parentage, see Gallatin County, Montana, birth certificate, Clyde Kenneth Crook (1914); Clerk & Recorder's Office, Bozeman. Note: Clyde Crook's children, Dennis, Gaynl, and Gary, legally changed their surname to VanderWerff between 1961 and 1966.

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Figure 2
Selected Descents Traced to William and Hannah (Johnson) Crook

For Eliza's, Williams's, Elizabeth's, and David's parentage, see the text.

For the parentage of Henry Crook see "1870 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7163> : accessed 10 October 2017) > Wisconsin > Green Lake > Brooklyn > Image 15, dwelling 135, family 42, 135 William Crook household; citing NARA microfilm T593, roll 1715; FHL film no.: 553,124. For Frederick's parentage, see "1910 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7884> : accessed 10 October 2017) > Wisconsin > Green Lake > Green Lake > Image 11, dwelling 1,842, family 916, Charles Cox household; citing NARA microfilm M653, roll 1,410; FHL film no.: 805,410. For Jessie's parentage, see "1910 United States Federal Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=7884> : accessed 9 August 2018) > Missouri > Jasper > Carthage > Ward 5 > District 0074 > Image 31, dwelling 377, family 385, Anna Cox household; citing NARA microfilm publication T624, roll 791; FHL film no. 1,374,804. For Edna's parentage, see "1920 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=6061> : accessed 10 October 2017) > Kansas > Wyandotte > Bonner Springs > District 0151 > Image 12, dwelling 134, family 140, O. Harlow household; citing NARA microfilm T625, roll 554.

For the parentage of Henry Crook see "1870 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7163> : accessed 10 October 2017) > Wisconsin > Green Lake > Brooklyn > Image 15, dwelling 135, family 42, 135 William Crook household; citing NARA microfilm T593, roll 1715; FHL film no.: 553,124. For Frederick's parentage, see "1910 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7884> : accessed 10 October 2017) > Wisconsin > Green Lake > Brooklyn > District 0106 > Image 7-8, dwelling 75, family 75, Henry Crook household; citing NARA microfilm T624, roll 1,713; FHL film no.: 1,375,726. For Barbara's parentage, see "1930 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=6224> : accessed 10 October 2017) > Wisconsin > Green Lake > Brooklyn > District 0007 > Image 16, dwelling 141, family 141, Henry S. Crook household; citing NARA microfilm T626, roll 2,575; FHL film no.: 2,342,309. For Bonnie (Brendt) Japuntich's parentage, see "Public Member Tree," database, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=1030> : accessed 9 August 2018) > search "Bonnie Jean Brendt" > Japuntich/Welle Family Tree > Roy F. Berndt profile.

For William Henry Dixon's parentage, see "1880 United States Federal Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=6742> : accessed 9 August 2018) > Wisconsin > Fond du Lac > Metoman > 051 > Image 4, dwelling 39, family 41, Frank Dixon household; citing NARA microfilm publication T9, roll 1,429; FHL film no. 5,162,836. For Charles William Dixon's parentage, see... For Ray Edwin Dixon's parentage, see "1930 United States Federal Census," database with images, *Ancestry* (<https://search.ancestry.com/search/db.aspx?dbid=6224> : accessed 9 August 2018) > Minnesota > Olmsted > Pleasant Grove > District 0017 > Image 10, dwelling 107, family 110, Charles W. Dixon household; citing NARA microfilm publication T626, roll 1,110; FHL film no. 4,951,361.

For the parentage of Alice Crook, see "1880 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=6742> : accessed 10 October 2017) > Wisconsin > Green Lake > Green Lake > 066 > Image 15, dwelling 131, family 135, David Crook household; citing NARA microfilm T9, roll 1,428; FHL film no.: 1,255,428. For Ruth's parentage, see "1900 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7602> : accessed 10 October 2017) > Wisconsin > Fond du Lac > Rosendale > District 0044 > Image 14, dwelling 136, family 137, James B. Burrows [*vis*] household; citing NARA microfilm T623, roll 1,789; FHL film no.: 1,2401,789. For Myron's parentage see "1940 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=2442> : accessed 10 October 2017) > Wisconsin > Dodge > Beaver Dam > 14-7 > Image 14, dwelling 431, family 160, Myron Nadolski household; citing NARA microfilm T627, roll 4,472. For Lyle's parentage, see "1910 U.S. Federal Census," database with images, *Ancestry* (<http://search.ancestry.com/search/db.aspx?dbid=7884> : accessed 10 October 2017) > Nebraska > Morrill > Camp Clarke > District 0194 > Image 17, dwelling 156, family 158, Burt Burroughs household; citing NARA microfilm T624, roll 852; FHL film no.: 1,374,865. For parents of Arlettia Bourroughs, see *Fina A Grave*, database with images <https://www.findagrave.com> : accessed 10 August 2018), memorial 56872259, Arlettia Ann Burroughs Hill (1931-2006), West Side Cemetery District, Taft, Kern County, California; memorial plaque photograph by naekat70.

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Table 5
Selected Traced and Genetic Relationships to Mary (Wold) Souza

DNA Donor (Crook Sibling)	Traced Relationship	Predicted cMs Shared Average	Average cMs Shared & Range	Actual cMs Shared
Myron Nadolski (David)	3C1R	26.56	46 0 – 332	24.5
Olive (Glendenning) Thomas (Eliza)	4C	13.28	35 0 – 127	14.3
Brian Japuntich (William)	4C1R	6.64	28 0 – 117	10.6

For traced relationship (column 2) see figures 1 and 2. C represents *cousin* and R represents *removed*. Thus, 3C1R means third cousin once-removed. For predicted average cMs for those relations (column 3) see “Autosomal DNA Statistics,” *International Society of Genetic Genealogy Wiki* (https://isogg.org/wiki/Autosomal_DNA_statistics). For average third cousin (3C, 3C1R) shared CMs and range (fourth column, see “Visualizing Data From the Shared cM Project,” <https://thegeneticgenealogist.com/2015/05/29/visualizing-data-from-the-shared-cm-project/> : accessed 12 August 2018). For average fourth cousin (4C, 4C1R) shared cMs and range (column 4), see “The Shared cM Project 3.0 tool v4,” *DNAPainter: Tools* (<https://dnainter.com/tools/sharedcmv4>). For total shared cMs on segments greater than 7 cMs (column 5), see “One-to-One compare,” *GEDmatch* (gedmatch.com), kit A641966 (Mary (Wold) Souza) compared individually to kits A287698 (Brian Japuntich), A711733 (Myron Nadolski), and A936811 (Olive (Glendenning) Thomas). The acronym cMs refers to centiMorgans, a measure of genetic linkage based on recombinant frequency.

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Table 6
Selected Traced and Genetic Relationships to Margaret (Dibble) Hanson

DNA Donor (Crook Sibling)	Traced Relationship	Predicted cMs Shared Average	Average cMs Shared & Range	Actual cMs Shared
Myron Nadolski (David)	3C	53.13	89 0 – 334	12.5
David Hill (Mary Ann)	3C1R	26.56	76 0-332	50.8
Kathryn Paine (David)	3C1R	26.56	76 0 – 332	11.8
Olive (Glendenning) Thomas (Eliza)	3C1R	26.56	76 0 – 332	14.3
Brian Japuntich (William)	3C2R	13.28	52 16.4 – 122	13.4
Descendant X2 (Elizabeth)	3C2R	13.28	52 16.4-122	31.0

For traced relationship (column 2) see figures 1 and 2. C represents *cousin* and R represents *removed*. Thus, 3C2R means third cousin twice-removed. For predicted average cMs for those relations (column 3) see “Autosomal DNA Statistics,” *International Society of Genetic Genealogy Wiki* (https://isogg.org/wiki/Autosomal_DNA_statistics). For average third cousin (3C, 3C1R, 3C2R) shared cMs and range (column 4), see “Visualizing Data From the Shared cM Project,” <https://thegeneticgenealogist.com/2015/05/29/visualizing-data-from-the-shared-cm-project/> : accessed 12 August 2018). For total shared cMs on segments greater than 7 cMs (column 5),’ ” *GEDmatch* (gedmatch.com), kit A638674 (Margaret (Dibble) Hanson) compared individually to kits A287698 (Brian Japuntich), A711733 (Myron Nadolski), A717757 (Kathryn (Paine) Ginther, and A936811 (Olive (Glendenning) Thomas; AncestryDNA “Shared Ancestor Hint,” Descendant X2. The acronym cMs refers to centiMorgans, a measure of genetic linkage based on recombinant frequency.

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Table 7
Selected Traced and Genetic Relationships to Clayton Crook

DNA Donor (Crook Sibling)	Traced Relationship	Predicted cMs Shared Average	Average cMs Shared & Range	Actual cMs Shared
Myron Nadolski (David)	3C1R	26.56	76 0 – 332	53.4
David Hill (Mary Ann)	4C	13.28	35 0-127	68.2
Kathryn Paine (David)	4C	13.28	35 0 – 127	37.4
Brian Japuntich (William)	4C1R	6.64	28 0 – 117	22.5

For traced relationship (column 2) see figures 1 and 2. C represents *cousin* and R represents *removed*. Thus, 3C1R means third cousin once-removed. For predicted average cMs for those relations (column 3) see “Autosomal DNA Statistics,” *International Society of Genetic Genealogy Wiki* (https://isogg.org/wiki/Autosomal_DNA_statistics). For average third cousin (3C1R) shared CMs and range (fourth column, see “Visualizing Data From the Shared cM Project,” <https://thegeneticgenealogist.com/2015/05/29/visualizing-data-from-the-shared-cm-project/> : accessed 12 August 2018). For average fourth cousin (4C, 4C1R) shared cMs and range (column 4), see “The Shared cM Project 3.0 tool v4,” DNAPainter: Tools (<https://dnainter.com/tools/sharedcmv4>). For total shared cMs on segments greater than 7 cMs (column 5), see “One-to-One compare,” *GEDmatch* (gedmatch.com), kit A512246 (Clayton Crook) compared individually to kits A287698 (Brian Japuntich), A711733 (Myron Nadolski), and A717757 (Kathryn Paine) Ginther. The acronym cMs refers to centiMorgans, a measure of genetic linkage based on recombinant frequency.

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Table 8 Selected Traced and Genetic Relationships to Dennis VanderWerff				
DNA Donor (Crook Sibling)	Traced Relationship	Predicted cMs Shared Average	Average cMs Shared & Range	Actual cMs Shared
Myron Nadolski (David)	3C	53.13	89 0 – 334	55.7
David Hill (Mary Ann)	3C1R	26.56	76 0-332	33.9
Olive (Glendenning) Thomas (Eliza)	3C1R	26.56	76 0 – 332	23.5
Brian Japuntich (William)	3C2R	13.28	52 16.4 – 122	18.4
<p>For traced relationship (column 2) see figures 1 and 2. C represents <i>cousin</i> and R represents <i>removed</i>. Thus, 3C2R means third cousin twice-removed. For predicted average cMs for those relations (column 3) see “Autosomal DNA Statistics,” <i>International Society of Genetic Genealogy Wiki</i> (https://isogg.org/wiki/Autosomal_DNA_statistics). For average third cousin (3C, 3C1R, 3C2R) shared CMs and range (column 4), see “Visualizing Data From the Shared cM Project,” https://thegeneticgenealogist.com/2015/05/29/visualizing-data-from-the-shared-cm-project/ : accessed 12 August 2018). For total shared cMs on segments greater than 7 cMs (column 5), see “‘One-to-One compare,’” <i>GEDmatch</i> (gedmatch.com), kit A858763 (Dennis VanderWerff) compared individually to kits A106747 (David Hill), A287698 (Brian Japuntich), A711733 (Myron Nadolski), and A936811 (Olive (Glendenning) Thomas. The acronym cMs refers to centiMorgans, a measure of genetic linkage based on recombinant frequency.</p>				

PROOF SUMMARY

Indirect DNA evidence of biological relationship between George Crook’s descendants and descendants of five Crook siblings (Tables 5-8) corroborates:

- Baptism evidence (Table 2)
- 1851 census relationship evidence (Table 3)
- Descents traced to William and Hannah Crook (Figures 1 and 2)

CONCLUSION

Most DNA data, with the exception of small (< 7cMs), is direct evidence of a genetic relationship. DNA data is indirect evidence of a specific type of biological relationship and must be analyzed and correlated with documentary evidence.

The combination of documentary and DNA evidence indicate that George Crook’s parents are William and Hannah Crook.