Taking the Next Steps in Your DNA Research

Salt Lake City Research Tour 2025

Christopher C. Child, Senior Genealogist
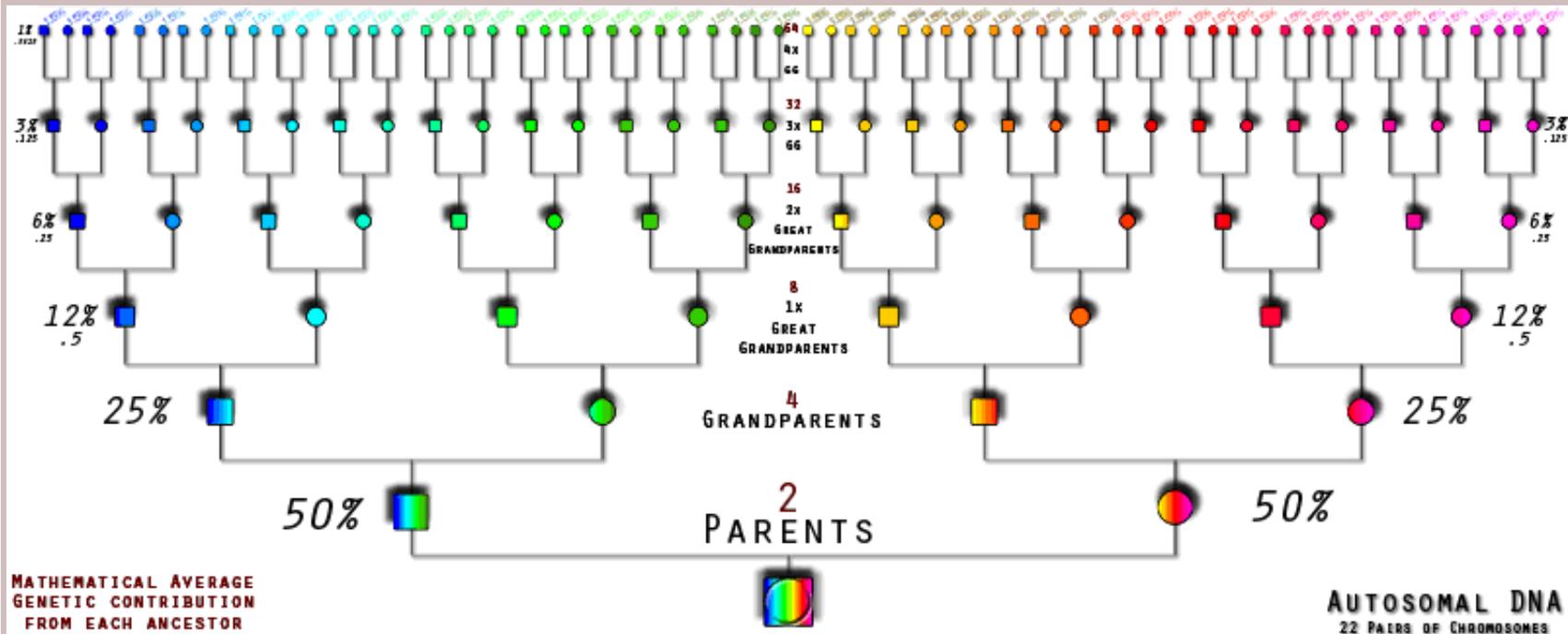
THE BRUE FAMILY LEARNING CENTER

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Overview

- How to plan a DNA project

- Finding test takers

- Organizing your results

- Using the cM chart to find MRCA
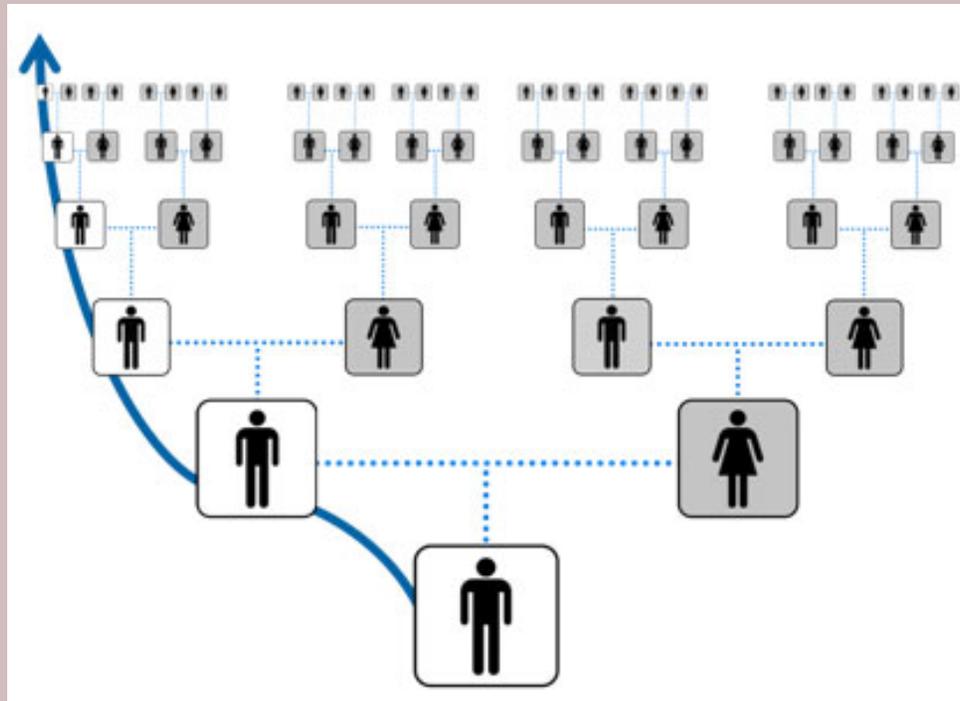
Review: The Basics of DNA Inheritance

Each human cell has 22 chromosomes split from the mother's and father's cells
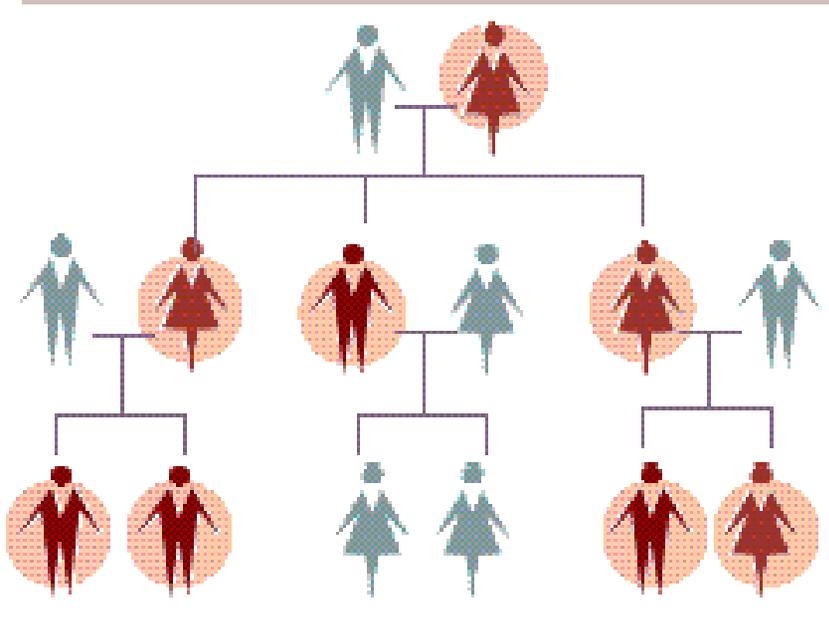
Autosomal inheritance

Y-DNA Testing

- Y chromosome passed from father to son

mtDNA Testing

- Inherited from mother to child

- Males inherit mtDNA, but do not pass mtDNA to their child

Why Do Anything Else?

Did They Even See Everything?

Creating a Plan of Action

Getting the Most From Your Results

- Provide a well-researched and documented tree at the testing company website. Try to go back 8 generations to your 6th great-grandparents where possible.

- Link your test to yourself at Ancestry, MyHeritage and FamilyTreeDNA.

- Update your Profile with surname and location information.

Benefits of Sharing / Going Private
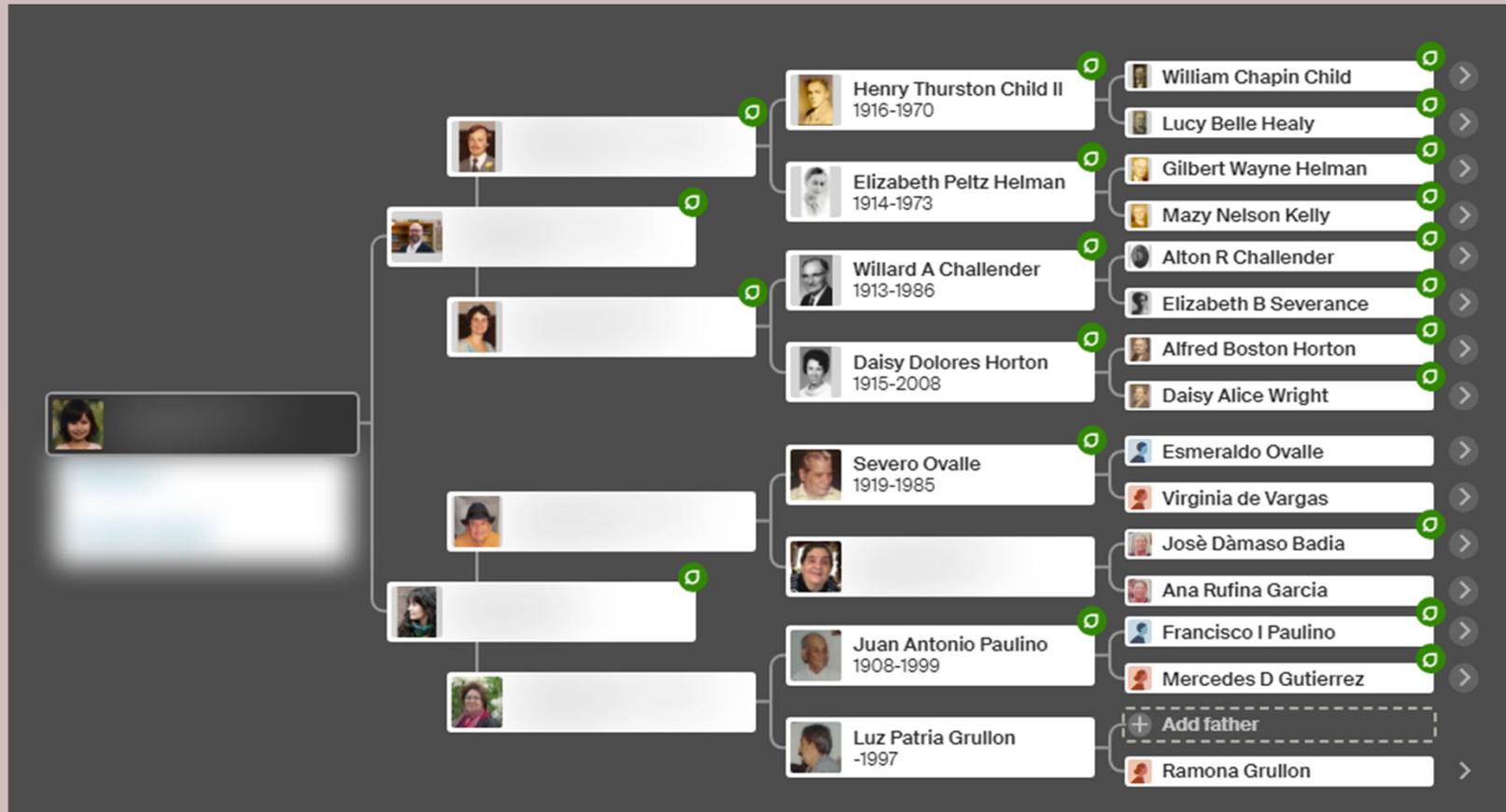
Organizing Your Results

Write Notes

- Most Recent Common Ancestors/Couple

- Surnames and/or Locations

Create Groups and Labels

- Colored dots for ancestral lines or theories

Interpreting Your Results

Working with Your Matches

- Start by sorting into your 4 grandparent lines. For example, see the Leeds Method.

- Write Notes.

- At Ancestry & MyHeritage use the colored dot groups and labels.

- Work back to older generations.

What is the Leeds Method?

- Method devised by genetic genealogist Dana Stewart Leeds

- Involves visually clustering 2nd-3rd cousin matches to identify the great-grandparents' lines

- The shared matches are reviewed from this list and assigned a color in a spreadsheet

Leeds Method

Identifying a Match

- Family member you recognize

- Information in their trees

- Shared surnames

- Common locations

- Paternal/Maternal or Parent1/Parent2 side

Ancestor Hints

Ancestry
Common Ancestor
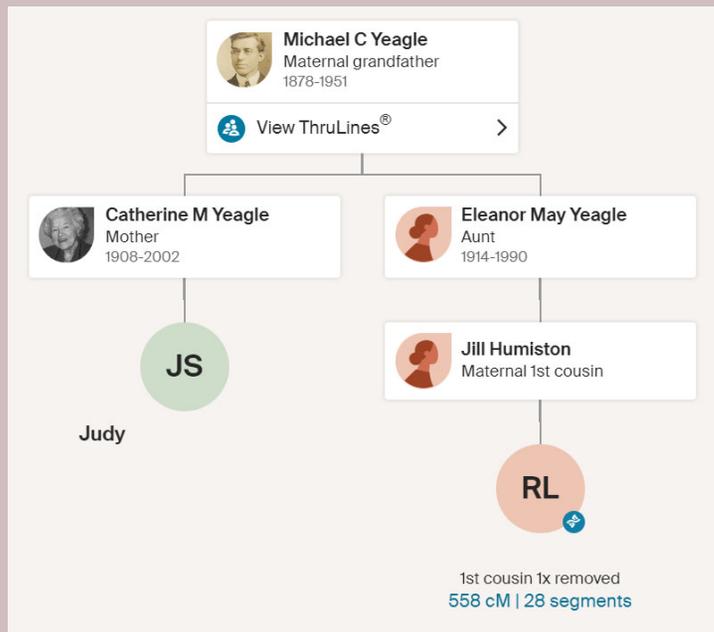
MyHeritage
Theory of Family Relativity
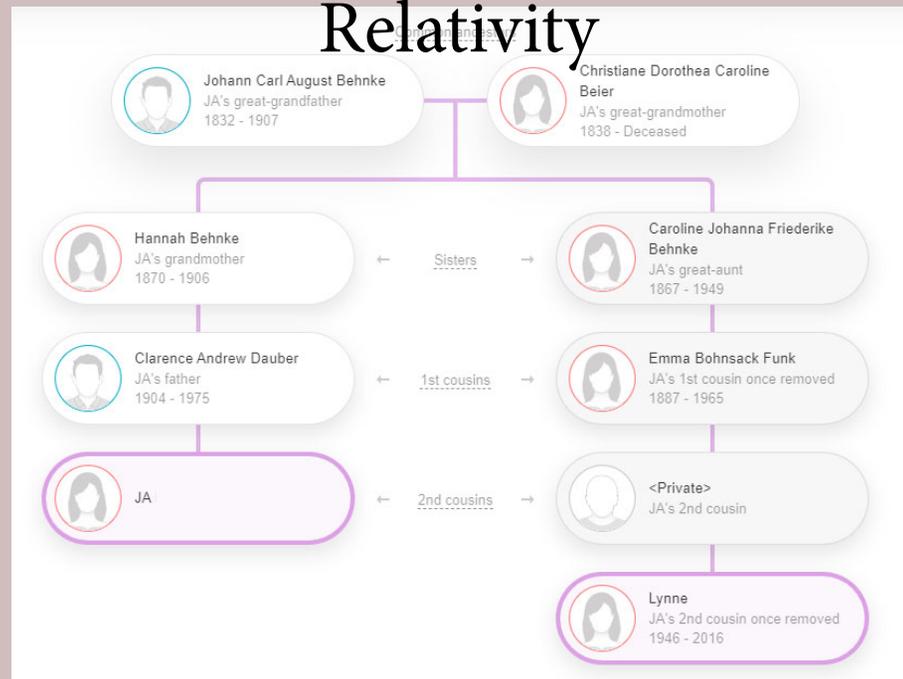
Other Ways to Identify a Match

- Build out a match's tree

- Look at Shared Matches

  – Maybe you already identified how you are related to a shared match

  – Evaluate carefully

  – Triangulate results: matching DNA segments between at least 3 people from different families

Other Company Tools

- MyHeritage – AutoClusters report

Other Company Tools

- 23andMe – Family Tree
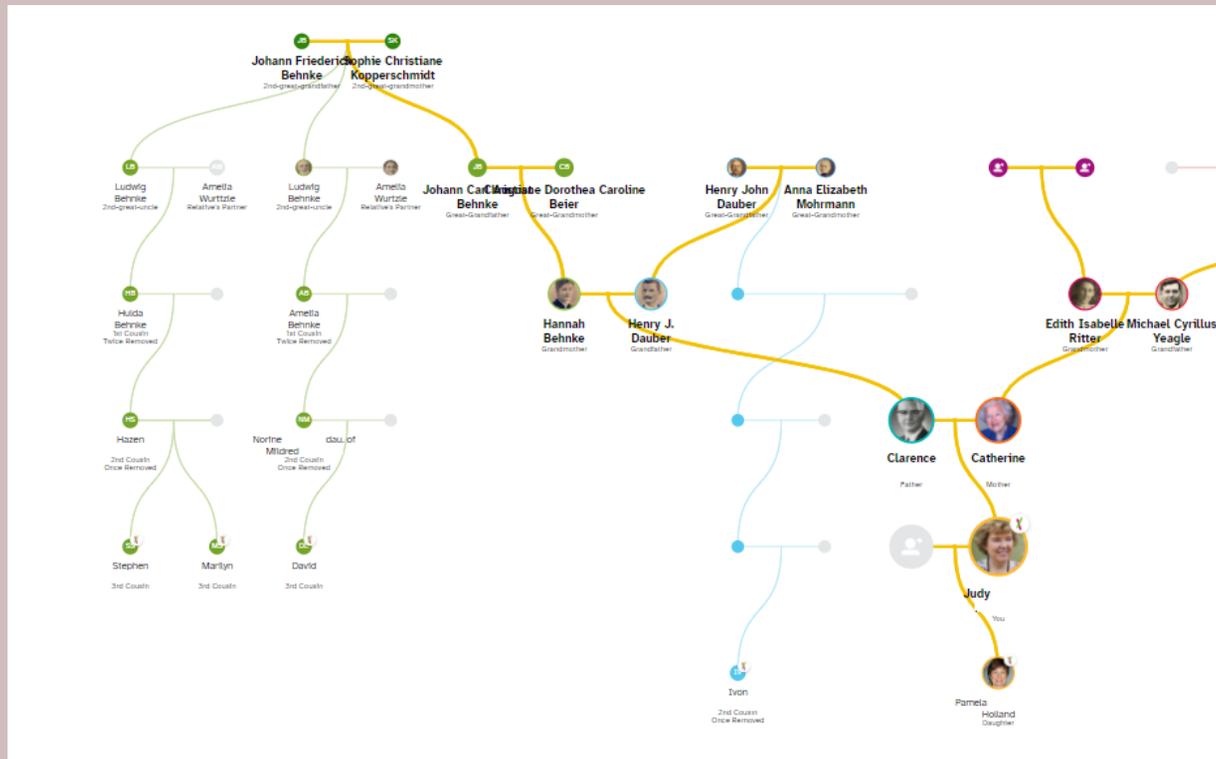
Identifying a Match Without Contact

- Do they use their username in other mediums

- Various online searches and directories

- If you later do have contact, consider how much information to share

No Response? No Problem

Jennifer _____ has **15 surnames**

This can help you navigate who in your family both of you are related to.

Bulcher, Doty, Kinzler, Turner, Tabor, Poly, Biles, Sturm, Hodge, Taber, Winans, Koon, Steiger, Bramhall

1st	2nd	3rd	4th
			Edward C. ___
		Keith Edward ___	
			Daisy Mae Tabor
	Charles ___		
			Clarence Bulcher
		Annabelle J. Bulcher	
			Martha Barga
Jennifer ___			
			Frank Jennings Turner
		John R. Turner	
			Marie Jones
	Turner		
			Jesse Lee Doty
		Katherine E. Doty	
			Cora Belle Kinzler
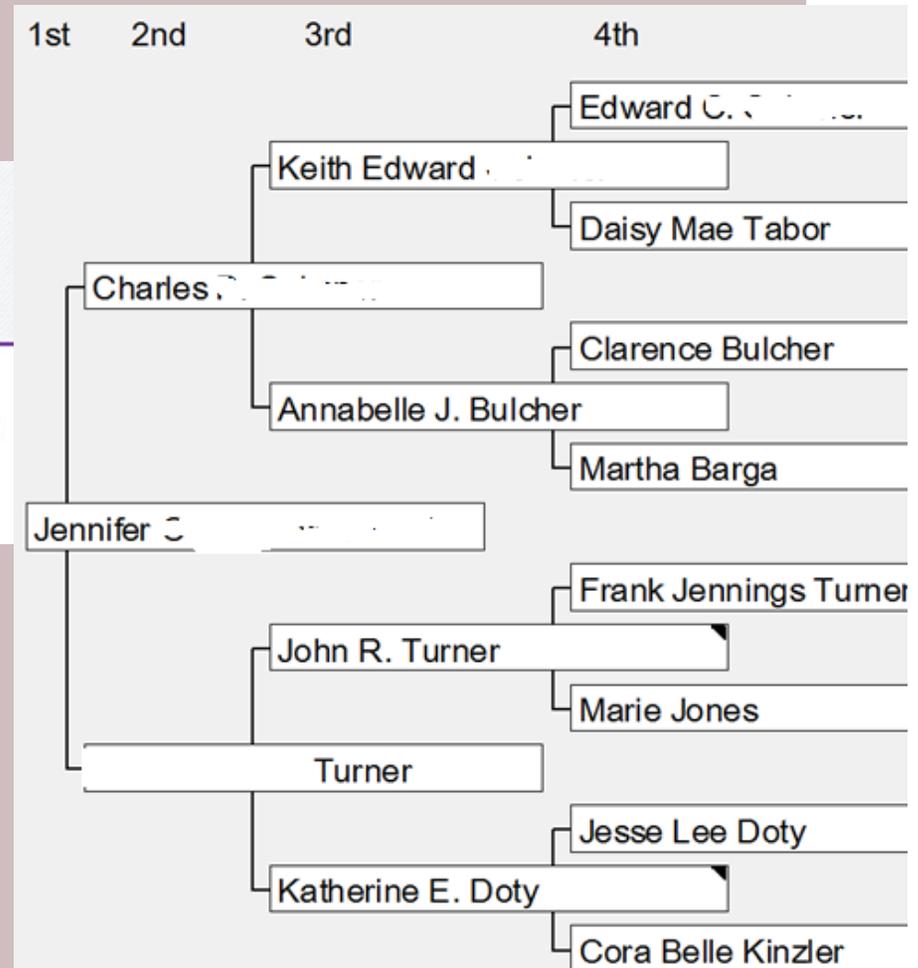
Tip
The trees of your matches may not be accurate

Finding Test Takers

Finding more matches

- Test close relatives and different branches of your family tree – the older the better

- Test at multiple companies to find the most matches

Who Has Tested / Who Hasn't
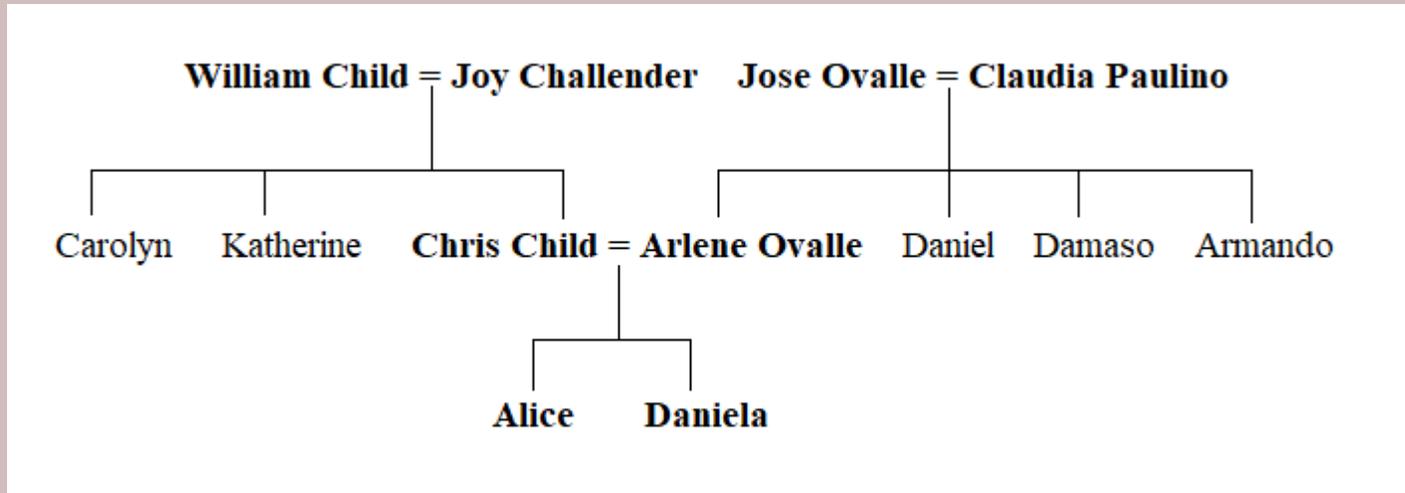
Finding Other Participants

- You need to compare your results to other individuals to confirm or reject a hypothesis

- Their DNA may hold valuable clues for your existing theories

- Your DNA may be "useless" for your project or theory

Tip
Complete a Tree of Living Descendants

Reverse Genealogy

- Use vital records and census research up until 1950

- Look for obituaries with children and more current addresses

- Use online resources such as telephone, property, and voter records

- Facebook and social media can be your friend!

Finding the "Ideal" DNA Participant

- Complete your living tree and identify the best possible descendants

- Find two independent lines that can help with your research

- Try to have back up candidates too

- Caution them about unexpected results

Appropriate Approaches to Requesting a Stranger's DNA

- Consider what you're asking of people – it could be a sensitive topic

- Carefully explain why you need their participation and provide as much information as you can

- Be truthful and honest with your intentions

- Offer to pay for their test

- Share your genealogical information

The Best Methods of Communication

- Facebook or Social Media

- Email

- Phone

- Physical address

- Contacting someone via their own online tree

- Queries in print/online

Informed Consent Agreements

- Help ensure that the tester is aware of what may come up in their DNA results

- Allows tester to specify how they want to receive their DNA results and/or permit data to be uploaded elsewhere

- Genetic genealogist Blaine Bettinger prepared forms available under Creative Commons license.

- This is NOT a legally binding form

Informed Consent Agreement Sample

Sample_Informed_Consent_Agreement DOCX

File Edit View Help

1 of 1   Copy link

Page 1 of 1

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Informed Consent Agreement

Thank you! You've agreed to provide a DNA sample to a genetic genealogy testing company. After you mail out your DNA sample (either a cheek swab or a saliva collection), the company will analyze some of your DNA and will provide your admixture estimates ("ethnicity") and a list of your genetic matches in the database. Your matches will be able to see you as one of their matches.

I will provide you with access to your test results and will answer any questions you may have about your results. You may, at any time now or in the future, ask me to remove your DNA test results from the company database, to the extent possible.

If you'd like to keep your test results as private as possible (understanding that DNA is ultimately identifiable even when anonymous), upon request I can use an unidentifiable pseudonym and will not associate the results with an identifiable email address.

Please check ONLY one of the following options:
_____ I DO want to be able to access my DNA test results;
_____ I do NOT want to be able to access my DNA test results; OR
_____ I DO want a summary of my DNA test results.

Please check ONLY one of the following options:
_____ I DO want to assign an unidentifiable pseudonym to my DNA results; OR
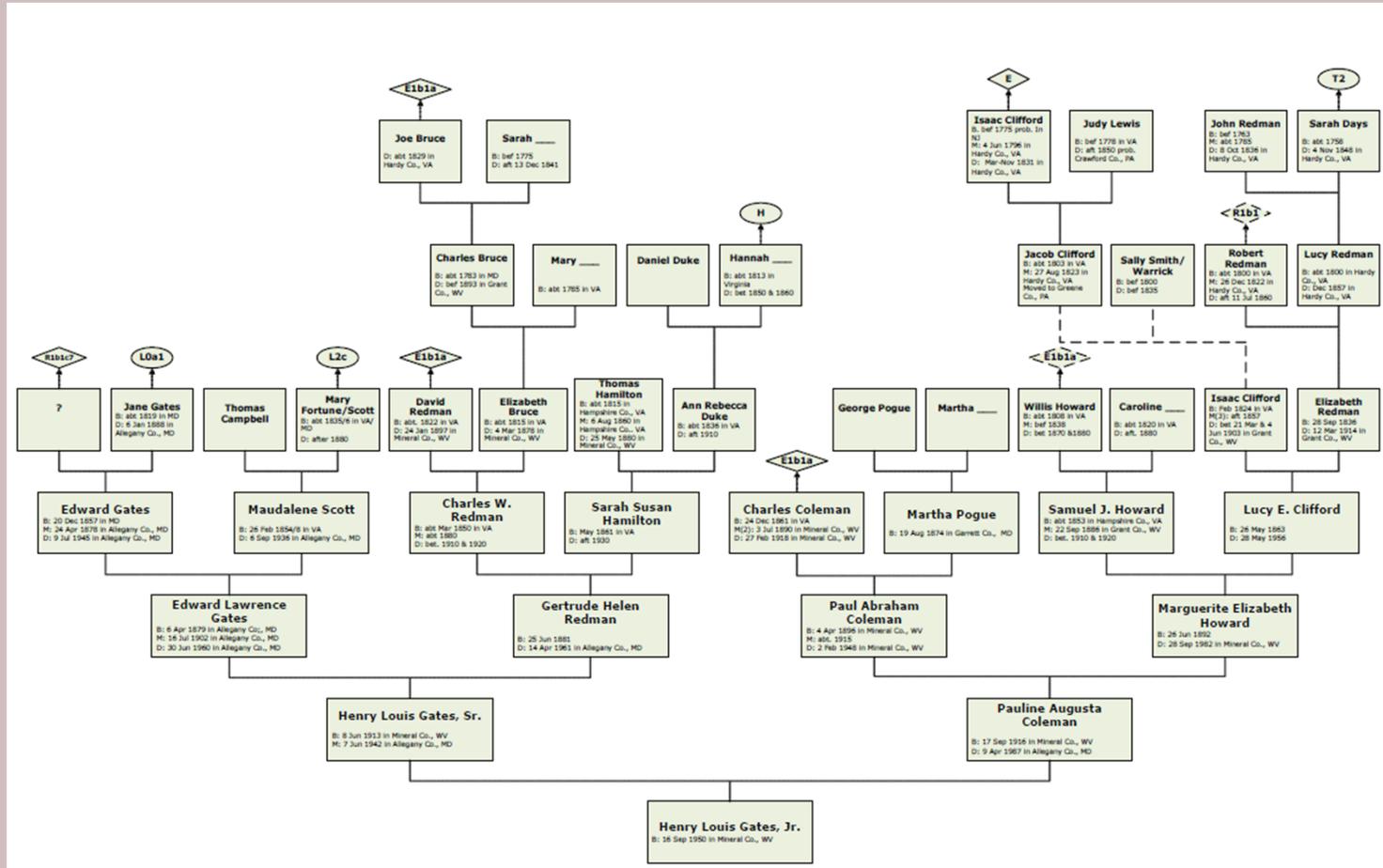I DO want to use my real name with my DNA results.

Goal

- Getting the most senior generation at any given point that descends from your deceased ancestor. Siblings, cousins, etc. will have different inherited DNA from these ancestors.
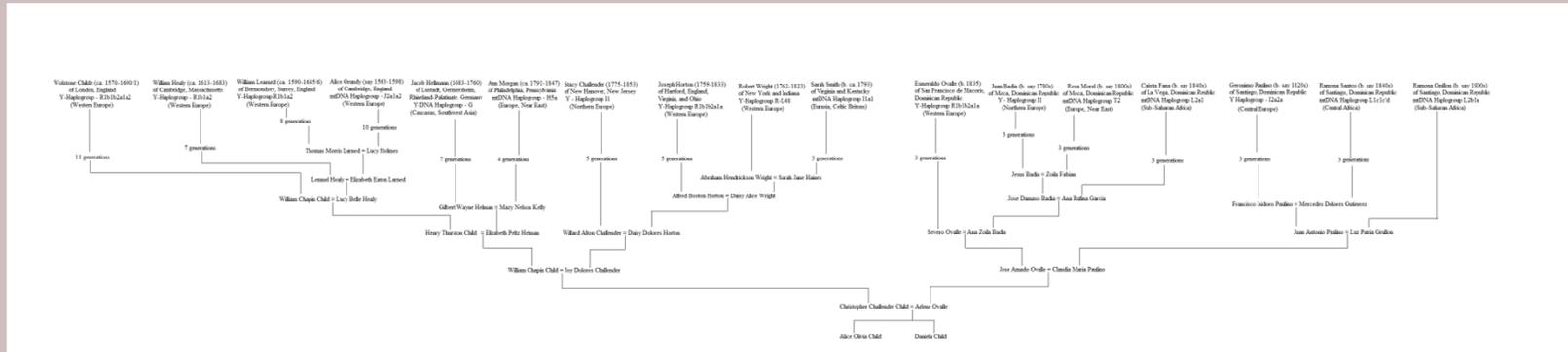
Who Else Could Be Helpful, Who Would Not Be
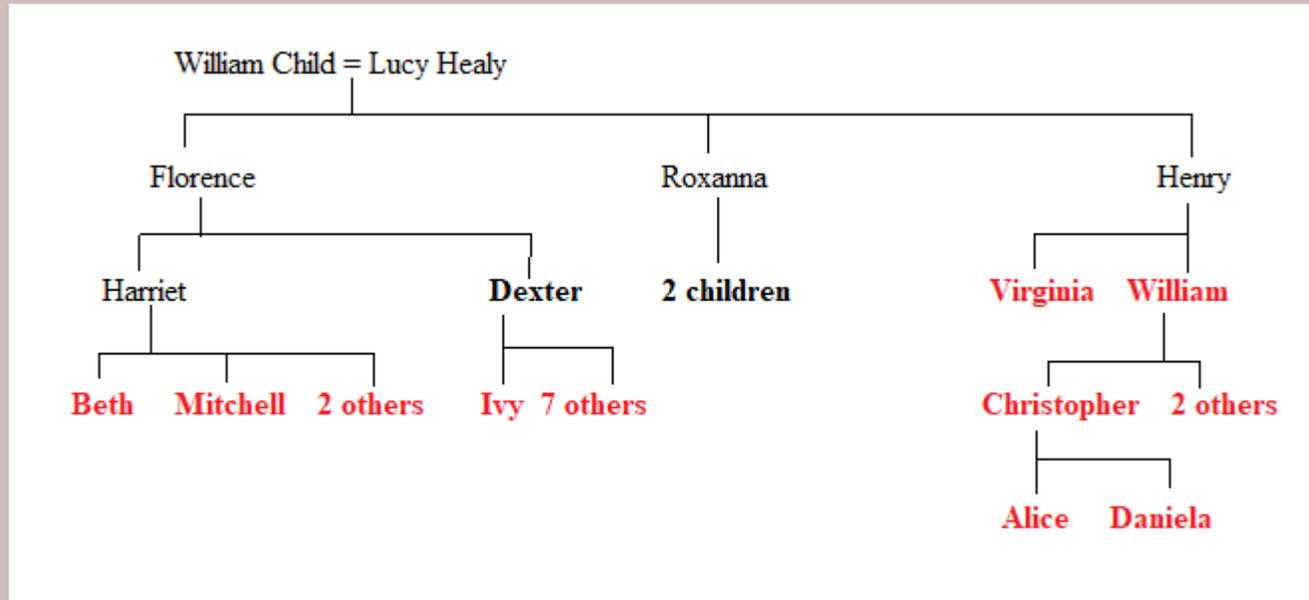
Usefulness of mtDNA / Y Map

My Own Y DNA / mtDNA Map

Do You Even Need Them?

Maternal Haplogroup

Maternal haplogroups identify unbroken lines of women that all trace back to the same ancient common ancestor.

You

Morgan

L2b1a

L1c1d

See full report

See full report

Because your haplogroups do not match, you are most likely not recently related through a direct line of female ancestors.

Paternal Haplogroup

Paternal haplogroups identify ancient lines of men that all trace back to the same common ancestor.

You

Morgan

Not available

R-L51

See full report

Although women inherit roughly 50% of their DNA from their fathers, they do not inherit Y chromosomes and, as a result, do not have paternal haplogroups.

Asking Your Own Relatives

- You may discover a recent surprise

Chasing the Y

Reaching Out to People That Have Already Taken One DNA Test

Common Ancestors

According to Ancestry member trees, these are the common ancestors that connect Joy Challender and jackgwright. View a common ancestor to see the relationship path that connects them.

Joy Challender and ... wright could be 2nd cousin through:
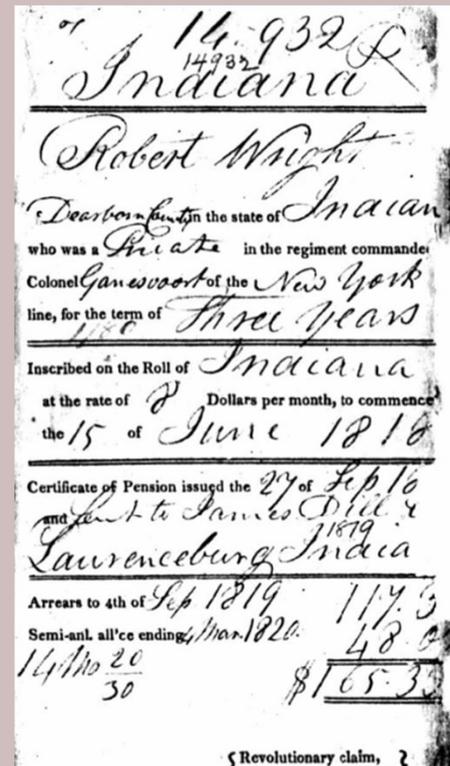
Abraham Hendrickson Wright
Great-grandfather
1848–1923
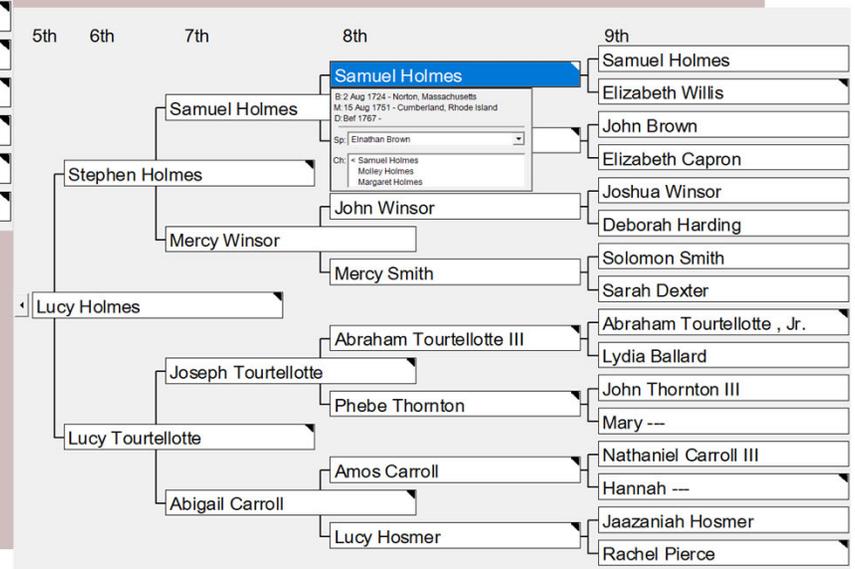View Relationship

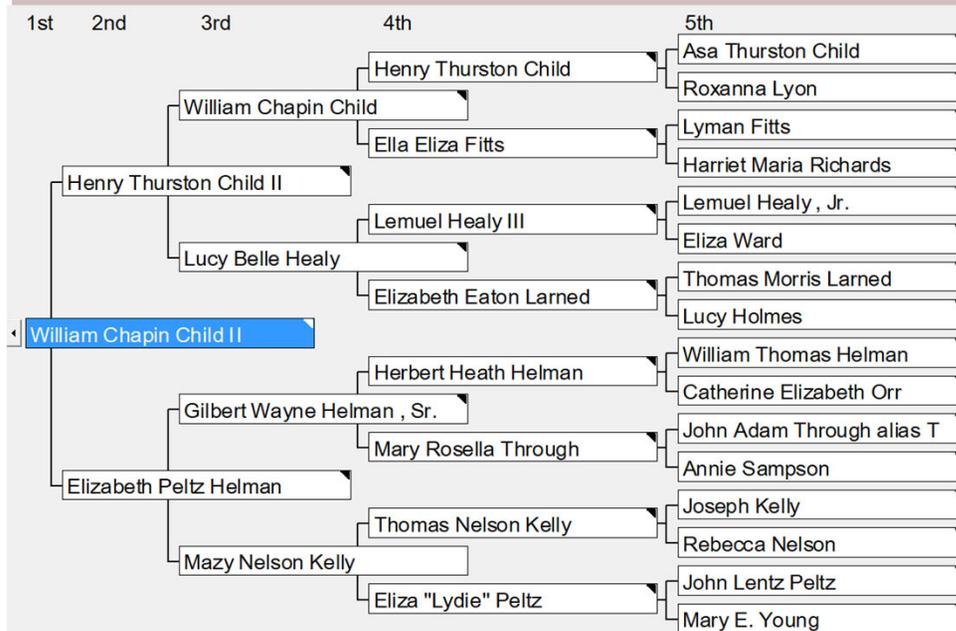**Sarah Jane Haines**
Great-grandmother
1854–1926
View Relationship

Still No Solution

Who Has the Right Cousins?

Different Levels Between the Same Generation

Matches to Holmes Men Elsewhere in America, Some with Proven English Origins

Benjamin Holmes
AUTOSOMAL TRANSFER | BIG Y-700 | Y-DNA37

Markers Tested	Genetic Distance	Big Y STR Differences	Y Haplogroup	Paternal Country of Origin	Paternal Earliest Known Ancestor
1 to 700	5 steps Link on Family Tree	Not Available	R-FT14784	England	George Brunswick Holmes, b. 181…

Match date: December 07 2018

Mr. Douglas W. Holmes
FAMILY FINDER | MTFULL SEQUENCE | BIG Y-700 | BIG Y-500

Markers Tested	Genetic Distance	Big Y STR Differences	Y Haplogroup	Paternal Country of Origin	Paternal Earliest Known Ancestor
1 to 700	5 steps Link on Family Tree	Not Available	R-FT14784	England	Thomas Holmes, b. Jun…

Match date: June 15 2018

Mr. Gordon Houston Holmes
AUTOSOMAL TRANSFER | MTFULL SEQUENCE | BIG Y-700 | Y-DNA111

Markers Tested	Genetic Distance	Big Y STR Differences	Y Haplogroup	Paternal Country of Origin	Paternal Earliest Known Ancestor
1 to 700	5 steps Link on Family Tree	Not Available	R-FT14784	United States	Walter Holmes

Match date: June 15 2018

Other Places to Look

Tip
Participating now may be key to a problem not on your radar.

Chasing the mt

Ramona Burgos
= Patricio Fabian

Maria de la Cruz Fabian   Zoila Fabian
                                 = Jesus Badia

Ramona Fabian   Damaso Badia
= Ramon Badia   = Rufina Garcia

Ana Ercilia Badia = Severo Ovalle = Ana Zoila Badia

          Dulce   Jose

          Diana   Arlene
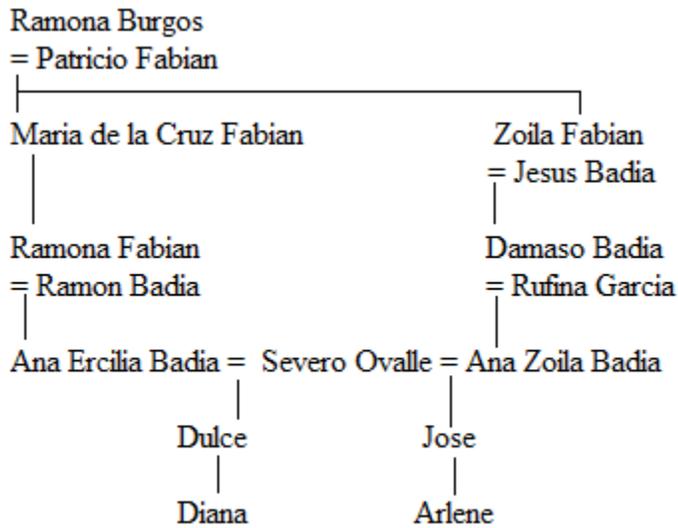
Haplogroup T YOUR HAPLOGROUP

The mitochondrial haplogroup T is best characterized as a European lineage. With an origin in the Near East greater than 45,000 years ago, the major sub-lineages of haplogroup T entered Europe around the time of the Neolithic 10,000 years ago. Once in Europe, these sub-lineages underwent a dramatic expansion associated with the arrival of agriculture in Europe. Haplogroup T2 is one of the older sub-lineages and may have been present in Europe as early as the Late Upper Palaeolithic.

You can also view other haplogroups here.

Tip
Remember where your trees are!

Understanding CentiMorgans

What is a CentiMorgan

$$P(\text{recombination}|\text{linkage of } d \text{ cM}) = \sum_{k=0}^{\infty} P(2k+1 \text{ crossovers}|\text{linkage of } d \text{ cM})$$

$$= \sum_{k=0}^{\infty} e^{-d/100} \frac{(d/100)^{2k+1}}{(2k+1)!} = e^{-d/100} \sinh(d/100) = \frac{1 - e^{-2d/100}}{2},$$

- A unit for measuring genetic linkage

Shared cM Project

- Project of Blaine Bettinger, the Genetic Genealogist

- Understanding averages over time of shared centiMorgans between different levels of kinship

- Data on the International Society of Genetic Genealogists Website (ISOGG)

The Shared cM Project – **Version 4.0** (March 2020)

Blaine T. Bettinger
www.TheGeneticGenealogist.com
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How to read this chart:

Aunt/Uncle → Relationship
1741 → Average
1201 - 2282 → Range (min-max)

									Great-Great-Great-Grandparent	GGGG-Aunt/Uncle	
							Great-Great-Grandparent	GGG-Aunt/Uncle			
Half GG-Aunt/Uncle 208 103 – 284	Great-Grandparent 887 485 – 1486						Great-Great Aunt/Uncle 420 186 – 713	1C3R 117 25 – 238	2c3R 51 0 – 154		Other Relationships
Half 1C2R 125 16 – 269	Half Great-Aunt/Uncle 431 184 – 668	Grandparent 1754 984 – 2462					Great Aunt/Uncle 850 330 – 1467	1C2R 221 33 – 471	2c2R 71 0 – 244	3C2R 36 0 – 166	6C 18 0 – 71
Half 2c1R 66 0 – 190	Half 1C1R 224 62 – 469	Half Aunt/Uncle 871 492 – 1315	Parent 3485 2376 - 3720			Aunt/Uncle 1741 1201 - 2282	1C1R 433 102 – 980	2c1R 122 14 – 353	3C1R 48 0 – 192	4C1R 28 0 – 126	6C1R 15 0 – 56
Half 3c 48 0 – 168	Half 2c 120 10 – 325	Half 1C 449 156 – 979	Half-Sibling 1759 1160 – 2436	Sibling 2613 1613 – 3488	SELF	1C 866 396 – 1397	2c 229 41 – 592	3c 73 0 – 234	4c 35 0 – 139	5c 25 0 – 117	6C2R 13 0 – 45
Half 3c1R 37 0 – 139	Half 2c1R 66 0 – 190	Half 1C1R 224 62 – 469	Half Niece/Nephew 871 492 – 1315	Niece/Nephew 1740 1201 – 2282	Child 3487 2376 – 3720	1C1R 433 102 – 980	2c1R 122 14 – 353	3C1R 48 0 – 192	4C1R 28 0 – 126	5C1R 21 0 – 80	7C 14 0 – 57
Half 3c2R 27 0 – 78	Half 2c2R 48 0 – 144	Half 1C2R 125 16 – 269	Half Great Niece/Nephew 431 184 – 668	Great-Niece/Nephew 850 330 – 1467	Grandchild 1754 984 – 2462	1C2R 221 33 – 471	2c2R 71 0 – 244	3C2R 36 0 – 166	4C2R 22 0 – 93	5C2R 18 0 – 65	7C1R 12 0 – 50
Half 3c3R	Half 2c3R	Half 1C3R 60 0 – 120	Half GG Niece/Nephew 208 103 – 284	Great-Great-Niece/Nephew 420 186 – 713	Great-Grandchild 887 485 – 1486	1C3R 117 25 – 238	2c3R 51 0 – 154	3C3R 27 0 – 98	4C3R 19 0 – 60	5C3R 13 0 – 30	8C 11 0 – 42

Minimum was automatically set to 0 cM for relationships more distant than Half 2C, and averages were determined only for submissions in which DNA was shared

Tip
Shared cMs alone are not proof of a specific kinship

How Results May Appear By Company

23andme

MyHeritage

FamilyTreeDNA

Tip
Endogamy will often skew these results.

Endogamy

- The custom of marrying only within the limits of a local community, clan, or tribe

- In genealogical custom, this tends to regard families that married their cousins over several generations, resulting in higher than predicted levels of shared DNA due to multiple kinships.

Endogamous Ancestry (Extreme)
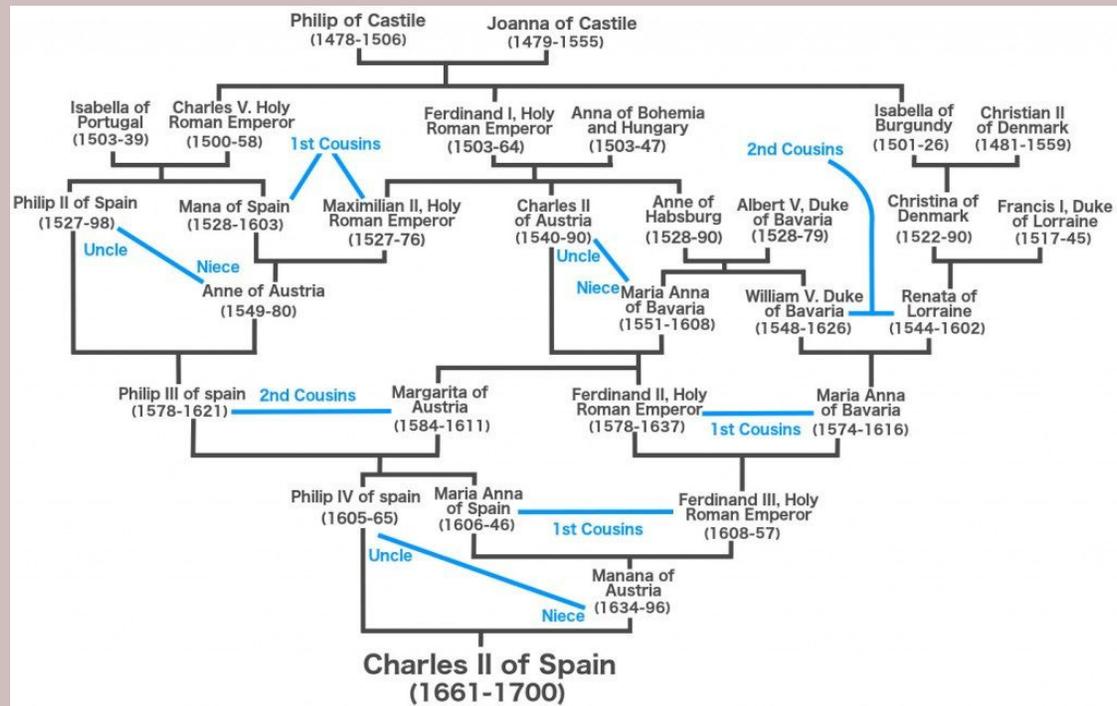
One Quarter "Endogamous"
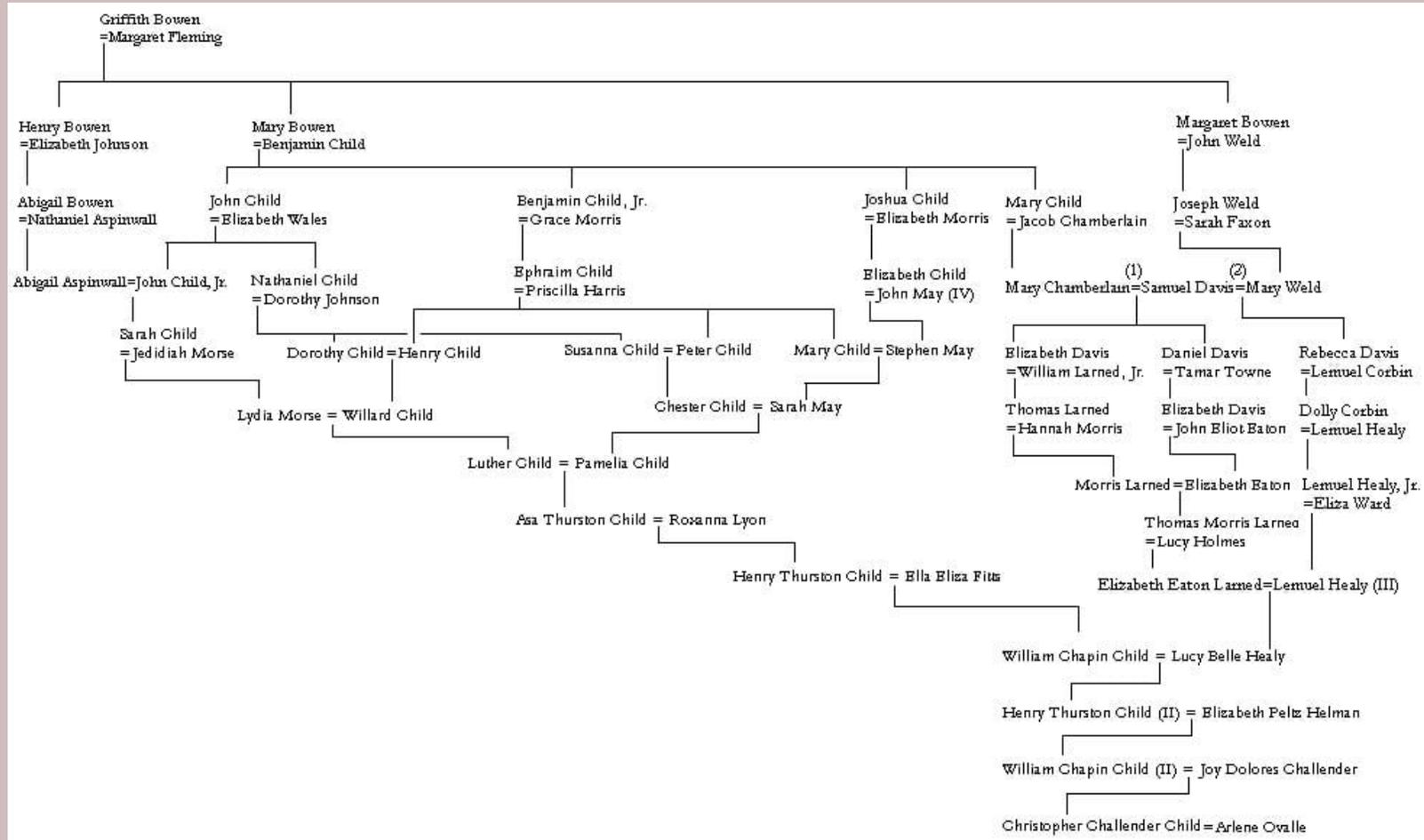
See How Matches Compare with the "Less Endogamous"

Langley matches

George Langley (1846–1924) = Clara Emma Shorey (b. 1857)

Frank Elmer Langley (1877–1953)
= Maria Wright

Perry Langley (1877–1960)
= Euphemia Clark

Wallace Langley *alias* Elmer Wallace (1900–1954)
~ Hope Weidman Potter (1897–1986)
  | = William Edward Wanamaker (1866–1926)
Ernest Francis Wanamaker (1923–2011)
= Thelma Odessa Porter (1925–2009)
  |
Kevin Wanamaker

Clayton Langley (1909–1976)
= Blanche Eva Humphrey (1915–1965)
  |
Violet M. Langley
= Alden L. Richardson
  |
D.R.

Winfred Langley (1902–1982) = Maud Langley
  (1911–1993)

Vernon E. Langley
= Beverly D. Knowles
  |
J. Langley

Kevin and J. are predicted to be first to second cousins (378 cM along 15 segments).
Kevin and D.R. are predicted to be second to third cousins (265 cM along 13 segments).

A Very Close Match
Yet No Common Ancestors Until the 18th Century

Francisco Gonzalez
Age: 70's
DNA managed by Francisco Gonzalez

Contact Francisco

Estimated relationships
1st cousin once removed - 2nd cousin once removed ⊘

DNA Match quality ⊘
Shared DNA: 2.4% (171.0 cM)
Shared segments: 14
Largest segment: 21 cM

⊟ Appears in a family tree with 5,669 people, managed by Francisco Gonzalez from Dominican Republic

How Many Times Related?
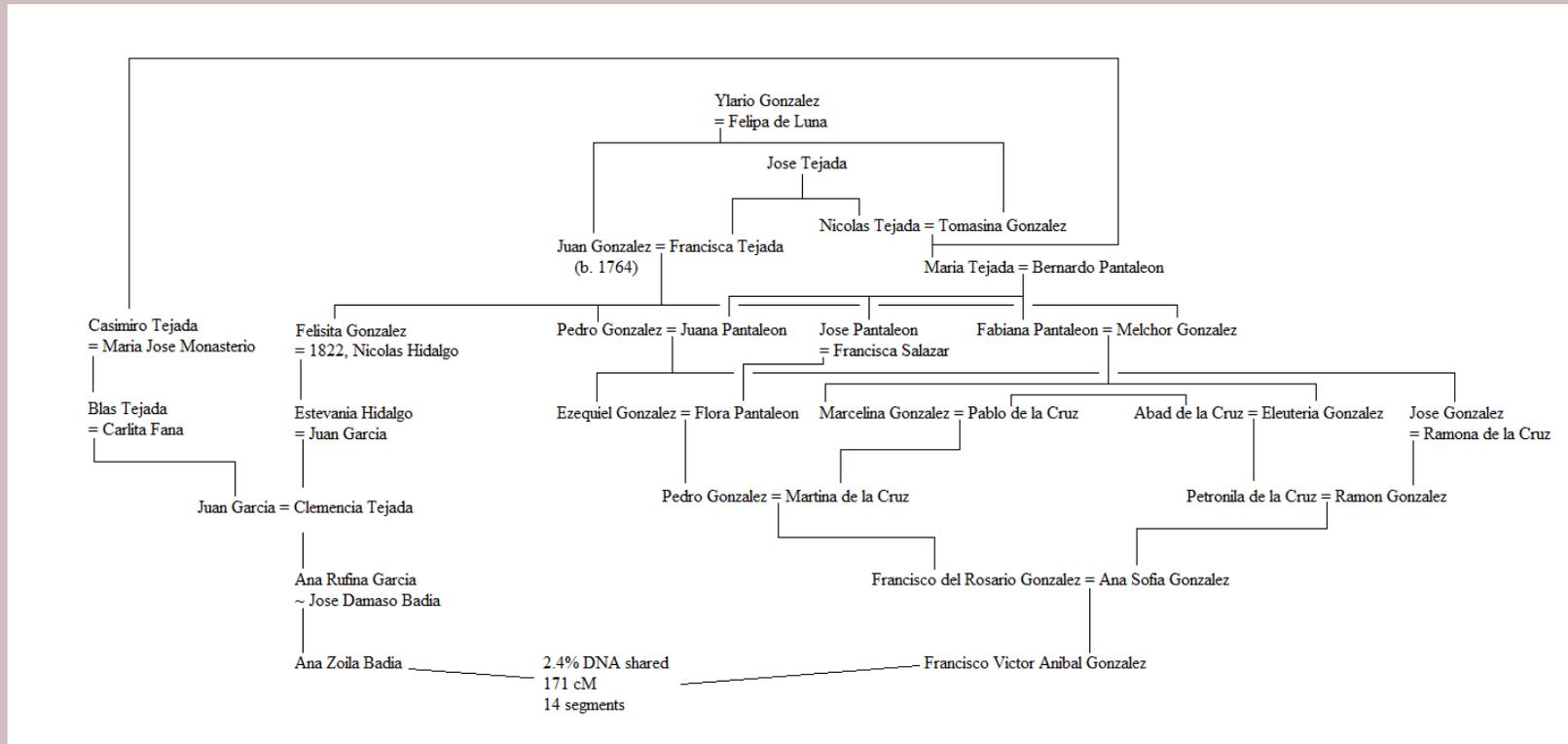
Tejada / Gonzalez Descents

- Two Tejada siblings marry two Gonzalez siblings

- Zoila descends from both couples due to her grandparents (married in 1885) being third cousins

- Francisco descends from one couple 4 times, and the other 5 times.

- 18 unique ways they are 4th cousins or 4th cousins once removed

Tip
Always Consider a "Half-Kinship"

Siblings Versus Half-Siblings

- Full siblings average 2613 cM (50%), ranging from 1613 to 3488

- Half siblings average 1759 cM (25%), ranging from 1160 to 2436

- Individuals between 1613 and 2436 (21 to 32%) are "within the overlap" of sibling versus half sibling

Other Considerations

- Maternal half siblings will share the same mtDNA

- Paternal half brothers will share the same Y-DNA

- Paternal half-sisters will have the same side of one part of their x DNA
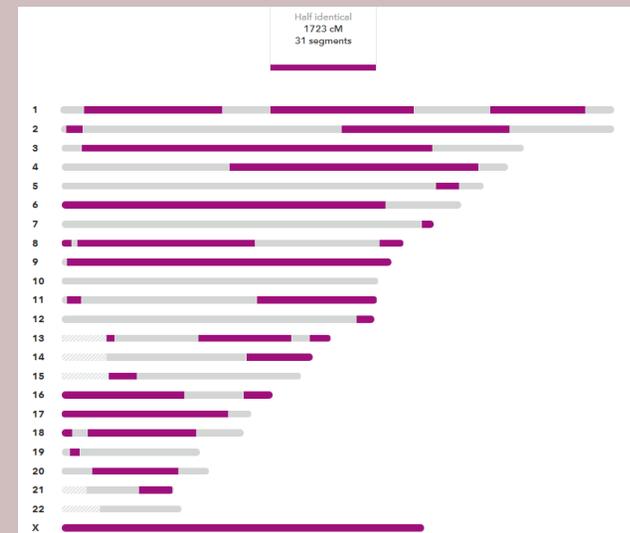
First Cousins Versus Half-First Cousins

- First cousins average 866 cM (12.5%), ranging from 396 to 1397

- Half first cousins average 449 cM (6.25%), ranging from 156 to 979

- Individuals between 396 to 979 are "within the overlap" over first cousins versus half first cousins

Smaller Overlaps

- Half siblings average 1759 cM (25%), ranging from 1160 to 2436

- First cousins average 866 cM (12.5%), ranging from 396 to 1397

- Levels under 1160 can corroborate a first cousin kinship, while levels over 1397

Staying Organized

- The likelihood of multiple siblings being beyond the overlap for particular kinships goes down

- Group matches by the particular half, quadrant, eight, etc.

- Keep in mind of identical twins, endogamous ancestry, and half level kinships

- Not all matches are what they first appear to be

THANK YOU!

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