

Tracing Back to 18th Century Scotland Using Autosomal DNA

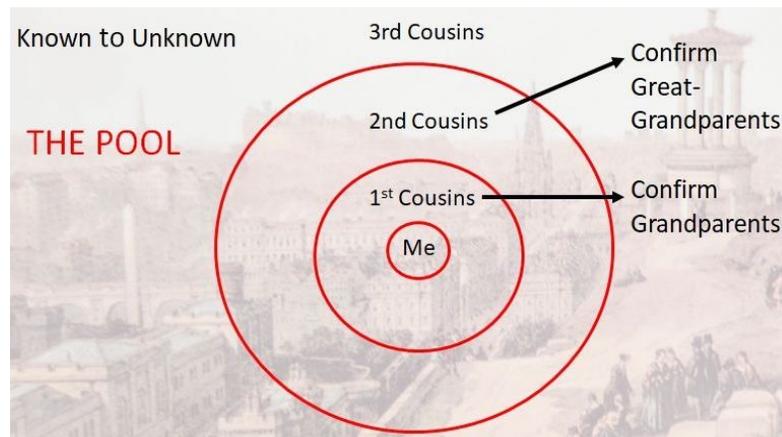
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This presentation analyses the well-documented family tree of my grandmother born in 1891 in Glasgow, Scotland. It follows the links from one generation to the next, looking for DNA evidence to confirm the relationships. The examples shown are from Ancestry, Family Tree DNA and GEDmatch. DNA evidence does not stand alone, but supports the documentary evidence. It becomes particularly valuable as we get back before the civil registration and census period when it is more difficult to find confirming pieces of paper evidence.

Autosomal DNA is described as having a range of five or six generations or 200-250 years. Confirming ancestry back into the 18th century is a reasonable goal for those researching British ancestors. Genealogists with deep roots in the United States may be able to go further back because of the volume of data available.

All relatives to the 2nd cousin level or closer should match each other. If they don't there is something wrong with the family lore or the documentary evidence. After that the odds of matching decline. About 90% of third cousins will match; 50% of fourth cousins; and only 10% of fifth cousins. This is because after several recombinations of autosomal DNA many distant relatives don't end up with the same segments of ancestral DNA.

Pools



Research is much easier if one builds up **pools** of identified DNA. Segments of DNA shared with a first cousin would be from one of our parents (or a pair of grandparents). Segments shared by two first cousins on the same side of the family would also identify DNA being from a set of grandparents. Segments shared by combinations of second cousins identify DNA that came from a specific grandparent (or great-grandparent couple). These relatives can then be used in combination to

identify more distant relatives, e.g. a match shared by my aunt and her cousin would be on the line of one their grandparents (or my great-grandparents). In this presentation I will use two pools of people: one for my mother's maternal grandmother's line and the other for her grandfather's. The maternal cousin will be the same in both pools but the second cousins will be different.

Relatives of an older generation are particularly valuable. We may only share 25% of our DNA on average with an aunt or uncle but all of their DNA came from our grandparents and is our ancestral DNA. It is worth tracing forward on collateral lines to find any parental first, second and third cousins still alive. Many people are willing to test— if someone else pays. Generations and ages become muddled as the relationships get more distant. A parental second or third cousin could be younger than us.

Aunts/uncles (if available) are very valuable testees. We share 50% of our DNA with a parent and just 25% (on average) with an aunt or uncle. All our aunt's or uncle's DNA came from our grandparents so about 75% of our aunt's/uncle's DNA is additional DNA from our grandparents that enables us to connect with more distant relatives.

In the case studies in this presentation I am going to use my mother and her sister as the central people for comparisons as all of their DNA came from my maternal grandparents and my DNA is only a subset of my mother's. Siblings, aunts/uncles, grandparents, great-aunts/uncles can all be our surrogates as the central person for comparisons.

If there are no relatives of an older generation available, we can compensate by testing more people of our generation. A first cousin shares about 25% of his DNA with us but 50% of his DNA is our ancestral DNA. We need more people to compare with in order to identify this 50%.

For people who do not have American ancestry, it is of great benefit to be pro-active in getting as many relatives as possible tested. This means not only the ones we know, but tracing further to identify more distant ones.

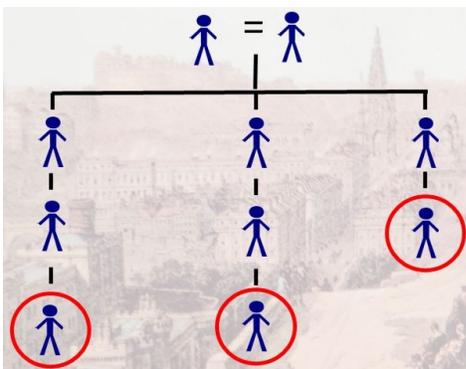
This presentation will illustrate the analytical techniques of triangulation and walking a segment back.

Triangulation

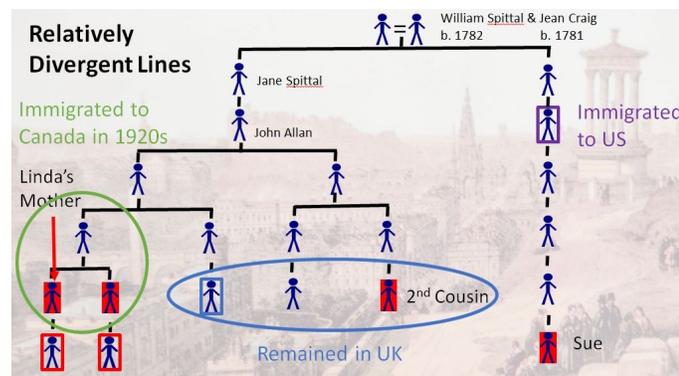
Triangulation involves identifying three or more people who have a paper trail back to the same ancestor or ancestral couple on divergent lines, who match each other on an autosomal DNA test, and who share a matching or overlapping segment of DNA.

The testing companies 23andMe, Family Tree DNA, MyHeritage and the third-party site GEDmatch all provide chromosome browsers that enable the researcher to look for matching segments. Ancestry does not so it is necessary for anyone who has tested only at Ancestry to transfer the raw data to another site to do this analysis.

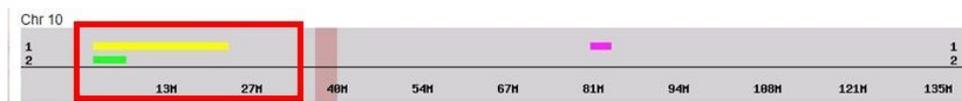
Divergent lines would mean descent from different children of the ancestral couple. Sometimes we only have partial divergence: two second cousins share a match at the same place with a fourth cousin. In this case I think of the segment as being "walked back" as far as the great-grandparents and the pool of potential ancestors that the fourth cousin could share with us is greatly reduced.



Divergent Lines



An Example of Relatively Divergent Lines



Overlapping Segments

The background above represents the chromosome browser of a kit on GEDmatch. The segments on lines 1 and 2 show where two documented third cousins have overlapping segments of DNA with this person.

Genetic testing is another tool for the genealogist. A ‘reasonably exhaustive search’ should include genetic evidence where relevant. Genetic genealogy can reveal surprises, just as the documentary research can.

Basic Level of Genetic Genealogy

People have varying amounts of time and money to devote to genetic genealogy. The basic level would be:

- Test at one of the major testing companies: 23andMe, Ancestry DNA, Family Tree DNA, MyHeritage
- Provide a family tree (just the direct ancestors with their birth and death dates and places - or more if you wish)
- Download your raw data from your testing company and upload it to GEDmatch - and provide a GEDcom of your pedigree data
- Answer emails or messages to the best of your ability

Your genetic relatives will be able to work with your data and maybe they will tell you of their discoveries.

If you want to do more...

- Test as many relatives as possible
- Transfer data to other sites and/or test at the other testing companies
- Explore the many third-party tools, e.g. DNA Painter
- Contact your matches to discuss shared surnames and places

If the researcher has samples, not just data, at Family Tree DNA for various relatives it will be possible to do Y-DNA and mitochondrial DNA for different family lines at a later date.

Genealogy - Bottom Up and Top Down

Adoptees use DNA tests to identify birth parents. Their technique is to build or expand on family trees for their matches in the hope of identifying the same couples on different trees (who would possibly be their ancestors as well). Many American genealogists do the same thing. I only do it if I can start with an identified person in the UK or Ireland as all my grandparents came from there to Canada.

I have found the top down approach very satisfying. I research collateral lines, following the descendants of my ancestors’ brothers and sisters. If they disappear from the UK/Ireland, I start looking for them elsewhere. Then I can sometimes connect with the limited trees that some of my matches provide or by using triangulation suggest to the match what their ancestral line is likely to be.

Remember that to figure out distant relationships, you need to have your pedigree well back in time.

Genealogical Records Used in this Presentation

Cemetery Records for the Eastern Necropolis, Glasgow

The original records for this and other Glasgow cemeteries are at the Cemeteries and Crematoria Department, Glasgow, Lanarkshire, Scotland.

Some of the records have been digitized by FamilySearch (Look under “Scotland, Lanark, Glasgow” and then “Cemeteries”

Glasgow Poor Law Records

These are held at the Mitchell Library in Glasgow.

Information at: <https://www.glasgowfamilyhistory.org.uk/ExploreRecords/Pages/Poor-Law.aspx>

Freedman's Bank Records (US)

"United States, Freedman's Bank Records, 1865-1874." Database with images. FamilySearch.

<http://FamilySearch.org> : 14 June 2016. Citing NARA microfilm publication M816. Washington, D.C.: National Archives and Records Administration, 1970.