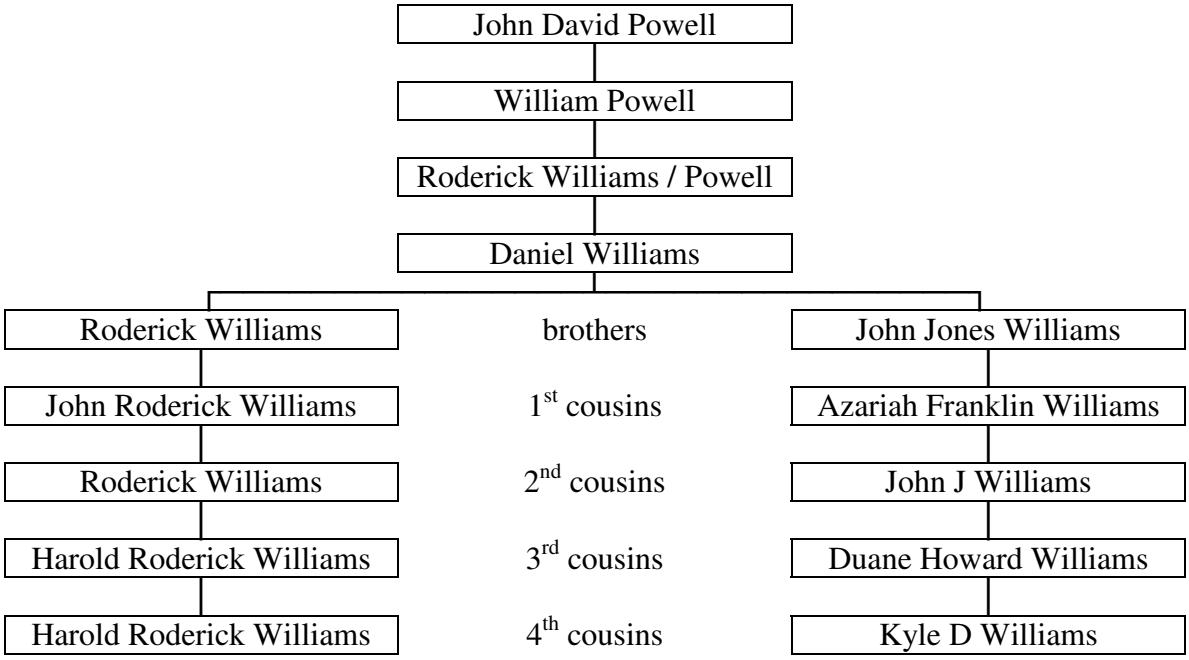
DNA Testing
Can Help with Our Genealogy!

A good carpenter knows how to use all the tools in his toolbox. A good musician knows how to use every note on the scale. Similarly, a good genealogist knows how to use every available resource. One scientific resource that has recently become available to genealogists is DNA testing.

Anyone can find technical details about DNA on the Internet, in scientific journals and elsewhere. To keep it simple, there are at least two kinds of DNA tests useful to genealogists. The most helpful is the Y-DNA test, which traces mutations that are transferred from male ancestors to male descendants. Less helpful is the mt-DNA test, which traces mutations that are transferred through female ancestors. For now, I will focus on the Y-DNA testing.

As far as I know, the first person in our family to get tested was Hal Williams (Harold Roderick Williams, Jr.) of Orange, California. In the summer of 2008, while searching the Internet for relatives, I came across Hal's pedigree chart on Family Tree DNA's website. That's how Hal and I met and discovered that we are 4th cousins, fellow descendants of Daniel Williams and Ruth Jones:



With considerable prompting, Hal persuaded me to get tested, too. I'm glad I did. I got my test from Family Tree DNA. Here's how it works: You order and pay for the test at www.familytreedna.com. They send you a kit with instructions. Following the instructions, you rub the inside of your cheeks three times with three different swabs. It's easy and painless. You deposit the tip of each swab into a small vial, place the vials in the provided envelope, and mail them back to the lab. Within weeks the lab analyzes your DNA and reports the Allele values in 67 DYS markers. Although you can get cheaper tests with fewer markers, I recommend you get the full 67, or at least 37.

You don't have to know what an Allele is or a DYS marker. Family Tree DNA explains such terms for those who are interested. Those who aren't so interested in the technicalities can go straight to the test results.

Haplogroups

One fun result is your haplogroup. According to the Family Tree DNA website, "A haplogroup is defined as all the male descendants of the single person who first showed a particular mutation, called a SNP [single nucleotide polymorphism]. These special mutations are extremely rare, and identify a group of people over a period of tens of thousands of years. Your haplogroup assignment indicates which part of the phylogenetic tree of male Homo Sapiens you descend from."

My predicted haplogroup is R1b1b. I have ordered a Deep Clade test to confirm my haplogroup and haplotype. Family Tree DNA tells us some interesting things about haplogroup R1b. It begins in Africa some 60,000 years ago:

- 60,000 years ago: 'Y Chromosome Adam': All Y-chromosome lineages lead to a single male, whom researchers have named 'Y Chromosome Adam.' While he was not the only male living at the time, no other lineages remain today.
- 50,000 years ago: Haplogroup BT: The First Split: The first split among Y-Chromosome Adam's descendants created haplogroups A and BT. BT ultimately became the parental haplogroup of most African and all non-African lineages.
- 50,000 years ago: Haplogroup CT: The Second Split: Those descendants of Y-Chromosome Adam who did not belong to haplogroups A or B eventually parented one other major African and all non-African lineages.
- 50,000 years ago: Haplogroup CF: The Third Split: Two branches emerged from the CT group, DE and CF. CF in turn split into haplogroups C, which traveled out of Africa along the coastal route, and F, which journeyed into the middle East.
- 45,000 years ago: Haplogroup F: Levant: People followed herds through a stretch of savannah in their second migration out of Africa. Haplogroup F was born during or after this migration and is the parent of most non-African branches.
- 40,000 years ago: Haplogroup K: Asia: The final branch of F, K is the parent of several haplogroups found in Europe, East Asia, and Polynesia. Most remaining K lineages are found at low frequency in eastern Asia and the Pacific.
- 35,000 years ago: Haplogroup P: Central Asia: P, one of the branches of K, is the parent of haplogroups Q and R. It likely split from K in Central Asia. To date, no members of haplogroup P have been found who do not belong to Q or R.
- 30,000 years ago: Haplogroup R: Central Asia: The second branch of P, R soon divided into two major lineages: R1 and R2. Remaining descendants of R who do not belong to these branches journeyed south into the Indian subcontinent.
- 30,000 years ago: Haplogroup R1: Central Asia: In turn, R1 split into its branches R1a and R1b in Central Asia. R1a, R1b, and the few remaining R1 lineages migrated west and settled in Europe.
- 25,000 years ago: Haplogroup R1b: Europe: R1b journeyed into Europe from Central Asia, then spread and multiplied until its lineages can be found throughout Europe and until it became the most frequent haplogroup in Western Europe.

Random Matches

As fascinating as the haplogroup is, the DNA matches are more relevant to the genealogical timescale. On the first 12 markers, I have 1,984 exact matches. These are 1,984 men who have taken the DNA test and are related to me from many generations back, probably beyond the reach of documentation. So the 12-marker matches are of limited genealogical use.

The 25-marker matches get more interesting. Of 278,736 people tested, I have one exact 25-marker match. Curiously, his surname is not Williams, but Hills. Disregarding our documentary evidence, and accepting the pure statistics, there is a 61.17% probability that Mr. Hills and I have a common ancestor more recently than the fourth generation – our great-great-grandfathers. There is an 84.92% probability that Mr. Hills and I have a common ancestor more recently than the eighth generation. The probabilities rise from there to a 99.66% probability that our paternal lines merge more recently than the 24th generation.

But our documentary evidence seems to defy the statistics. The Hills family moved from England to Salt Lake City, Utah, in the 1880's, about twenty years after my paternal ancestors moved out of Utah into Idaho. Sure, it's possible that a male-line descendant of the Hills family made his way to Idaho and had an affair with one of my foremothers, or that a male-line descendant of the Williams family made his way to Salt Lake City and had an affair with one of the Hills foremothers. But I have no documentary evidence to suggest such a thing.

Mr. Hills and I both have our genealogies documented to the eighth generation. The Hills family is traced back to about 1719 in Kent, England. The Williams family is traced back to about 1670 in Breconshire, Wales. Sure, it's possible that the Hills and Williams families had an affair in England or Wales within our documented timeframe, but our documents suggest that it was unlikely. If there was an extra-marital affair between the families, it most likely occurred in Utah or Idaho.

Still, there's little need to worry about an illicit affair. Our documentation pushes the statistical probabilities back in time. It's quite possible that our most recent common ancestor occurs legitimately between the eighth and twenty-fourth generations.

The 37-marker test came up with some interesting results, too. On the 37 markers, I have no exact matches, but there are 7 matches with a genetic distance of 2, all of whom are surnamed Phillips. At a genetic distance of 3, six out of seven are surnamed Phillips. At a genetic distance of 4, one out of six is surnamed Phillips. It seems likely, then, that one of my paternal ancestors, or a male-line uncle or cousin, had a son named Phillip, whose descendants adopted *Phillips* as their surname. This is very Welsh. Within my documented genealogy, for example, an ancestor with the given name William had descendants who adopted *Williams* as their surname.

Perspective

In an ideal world, documentation and biology would reflect one another perfectly. But this is not an ideal world. Few people are absolutely certain that their documented forefathers were really their biological forefathers. Though I prefer to think of myself as a Williams, I accept the possibility that my branch of the family might be more closely related – biologically – to the Phillips family, or the Hills family.

I want to make one thing clear. On paper, my descent from the Williams family is solid. In my Williams heritage, each father lovingly raised each son as his own. That

counts for more than biology. I don't know exactly how the Hills or Phillips blood comes in, but even if it were my own mother who conceived me without my father's knowledge, it would not decrease *in the slightest* my unconditional love for my parents who raised me. Sure, I would want to know who my biological forefathers were. I would want to meet them and my biological cousins. I would be kind to them. I might need a kidney someday. Or they might need mine. But that would not interfere with my true family. I am a Williams, and I'm proud of it.

DNA testing will never replace documentary genealogy, nor will it ever become as important as documentary genealogy. If DNA testing indicates that I have a biological identity that doesn't match my documentary identity, I would find the fact interesting, but I will not jettison my Williams heritage. I will not forget the special love I have for my Williams forefathers and my Williams cousins.

Strategic DNA Testing

We can learn some interesting things by getting our DNA tested and comparing results with the database of men who have already been tested. That's a passive approach. Taking a more active approach, we can target specific relatives to take DNA tests in order to prove or disprove our genealogical theories and hypotheses.

When Hal Williams persuaded me to get tested we expected our DNA results to be identical, or nearly identical, confirming our common ancestry. We were surprised, however, when I got the results back from my first 37-markers (I'm still waiting on the rest). Out of 37 markers, there were 12 discrepancies between me and Hal, one of which is off by four alleles. This calculates to a genetic distance of 15. Physically, Hal and I are about as unrelated as you can get! Does this increase the probability that I am – biologically – a Hills or a Phillips? Or is the problem on Hal's branch of the family?

I would like to pinpoint the anomaly. Considering the biological non-relationship between Hal and me, I have ten questions, only nine of which can be answered positively. At least one answer must be negative:

1. Is Kyle Williams the biological son of Duane Howard Williams?
2. Is Duane Howard Williams the biological son of John J Williams?
3. Is John J Williams the biological son of Azariah Franklin Williams?
4. Is Azariah Franklin Williams the biological son of John Jones Williams?
5. Is John Jones Williams the biological son of Daniel Williams?

6. Is Daniel Williams the biological father of Roderick Williams?
7. Is Roderick Williams the biological father of John Roderick Williams?
8. Is John Roderick Williams the biological father of Roderick Williams?
9. Is Roderick Williams the biological father of Harold Roderick Williams?
10. Is Harold Roderick Williams the biological father of Hal Williams?

DNA testing can help us answer these questions. I suggest that the most economical way to approach these questions is to answer five of them in the first whack. We need to get a DNA test from someone who meets three criteria: (1) He must be descended from Daniel Williams or one of Daniel's male-line forefathers; (2) He must be a male-line descendant, and therefore probably named Williams or Powell; and (3) He must not be descended from Roderick Williams (son of Daniel Williams) or John Jones Williams. If such a person were tested and his DNA matched mine, we could answer the first five

questions positively. If his DNA matched Hal's, we could answer the last five questions positively. From that point, other relatives can get tested to further narrow down the point of anomaly.

I have already contacted a male-line descendant of William Williams (a son of Roderick Williams alias Powell) and a male-line descendant of Samuel Daniel Williams (son of Daniel Williams) and invited them to get tested. I haven't received a response yet. If they choose not to participate, we will need to locate another candidate.

When a suitable cousin is located for narrowing down this specific anomaly, and he agrees to get tested, I propose that the Roderick Williams Association offer to pay for the test. In the meantime, any other male-line Williams who wants to get tested may certainly do so on his own account, and I hope he will share his results with the family. The more results we have to work with, the more precisely we can verify our genealogy.

Once the standard of Williams DNA is identified and we resolve the anomaly between Hal and me, another strategic use of DNA testing is to locate male-line descendants of Roderick Williams alias Powell and his first wife Elinor Jeffreys. A match would confirm that Roderick Williams really was the same person as Roderick Powell. Locating and testing male-line descendants of William Powell could verify that he was the father of Roderick Williams. Similarly, locating and testing male-line descendants of John David Powell could confirm that he is our ancestor. If any of these male-line descendants can be located, I propose that the Roderick Williams Association offer to pay for their DNA tests.

Come On, Guys, Let's All Get Tested!

DNA testing can help our family in a number of ways:

- Haplogroups can place our family in its global, historical context.
- Matches with others in the database can provide clues to extending our paternal genealogy.
- The ever-increasing database of men getting tested may someday match us with a cousin who has information we lack.
- We can use DNA testing strategically to confirm or disprove our documentary evidence, our theories, and our hypotheses.
- The more DNA tests we have in our family, the more firmly our records can be verified.

Let's use all the tools in our box. Let's play all the notes on the scale. Let's fearlessly examine our family tree from every angle, but always with open minds and loving hearts.

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