NORSE VIKING HERITAGE

My mother's maiden name is WILLIAMSON. Her ancestors in the paternal line came from the Shetland Islands.

The Shetland Islands were settled by Norse Vikings beginning before 800 AD. There is no evidence that any of the original Pict occupiers of the Islands were still there when the Vikings arrived, and if they were there it appears the invaders may have "put them to the sword" since it is presumed that had some survived there would have at least been more than a handful of Celtic place names in all of the Islands. In addition, the Shetland Islands were staging areas for Norse Viking raids to Scotland, Ireland, the west coast of England, and the Isle of Mann. Some sort of peaceful coexistence of the Picts and the warlike Vikings in such a small area does not seem likely. In the year 1468 Norway deeded Shetland to Scotland, and soon Scots began arriving as lairds, merchants, clergy and generally assumed positions in the upper ranks of society - leaving the most of the original Norse settlers to tend to small farms known as crofts where they raised a small amount of grain, tended herds of sheep, fished, participated in whaling expeditions, and later large numbers, including great great grandfather Robert, joined the Merchant Navy.

When the Scots arrived they of course brought their customs, such as using established surnames such as Bruce, Stewart and Mowat which were passed on from father to son to the present day. The Norse, however, with a very few exceptions, used a patronymic naming practice where a William, son of James, would be known as William Jamieson. However, when William had children his sons would have the surname Williamson and the daughters would be known as William's daughter. By the turn of the 19th century most families of Norse descent adopted whatever surname was in use in the family at that time - and the name became a permanent surname just like Brown. This is what happened in our family since the father of Robert’s father Gilbert Basil Williamson was William Matthewson, and the genealogy shows a number of surname changes (Thomason, Lawrenson, etc. until the late 1600s when the records go cold). So Williamson is an "Aboriginal Shetland" surname (ends in “son”). The first Williamson ancestor likely arrived at the time of the Norse Viking settlement about 800AD. The genealogical evidence suggested Norse descent, as did family tradition (I was told at family gatherings that we were not Scots, but Norwegians) - but what about the DNA evidence?

Since my grandfather Gilbert WILLIAMSON (whose grandfather Robert WILLIAMSON was born 1819 Mid Yell, Island of Yell, Shetland) had passed away I requested that one of my uncles (who would have the same Y chromosome as their father) supply a sample for DNA analysis. The results were not surprising.

Y Chromosome and the R1a1 Haplogroup:

It turns out that my uncle's Y-DNA haplogroup is R1a1 via a Y-SNP marker known as M17 where there is a deletion of a single nucleotide base at this location. He has few exact matches is any of the standard databases in the world. One is in Western Norway, the other in Tibet for his haplotype within this haplogroup. In other words it is a very

very rare signature. As to exact matches in the Family Tree DNA database to 12 markers, the only exact match at 12 markers and beyond found so far is with a BLANCHE (BLANCE), a surname found only in Shetland and whose genealogy in that branch stops at about 1749, a ROBERTSON, and another WILLIAMSON whose ancestor Robert was a first cousin of our Robert (born 1819). It is unknown at present how the Blances from Delting (but not the Island of Yell) link to our WILLIAMSONS.

Considering one step mutations (11/12) he has a single one mutation near match, and that person was from Shetland (sample size of 38). More recently, close matches have appeared in Norway and Sweden, and a scattering around the "Viking world".

What follows is a hypothesis that I had arrived at prior to 2005, but which today I no longer support – although I have not entirely ruled it out. I leave it here for historical reasons.

At the two - step (10/12) match level we find large numbers of individuals from the Russian Altai (Siberia), India, Mongolia. The only exact match in the forensic users world - wide database of 100,000 is someone from Nepal - with others with very close haplotypes (despite the rarity). This may simply be an example of identical by state versus descent (in other words coincidence), but it is possible that the source population split in Mongolia, some moving south to Nepal and others west along the Silk Road to Europe. The Williamson signature may have originated in the Sibertia Altai near the Chinese border, and arrived in Scandanavia about 410 AD with the Swedes (Osterogoths) and Scythians then living north of the Black Sea after the fall of the Roman Empire. Rsearchers generally agree that anyone from Britain with a R1a haplotype is of Norse Viking descent - the ancestor coming from the western fiords of Norway (the frequency of R1a haplotypes is about 30% across Norway). The Williamson ancestor likely came from the Western Region of Norway around the area of Bergen and Hordaland. In a very large Norwegian database from a recent academic study there is only one exact match (10 markers) to the Williamson signature and that person is from the West of the country. The closest matches all come from this area too. The ancestor also has a characteristic Norwegian motif at a marker called YCAIIa,b where almost all in the world are 19,23. About 40% of Norwegians (and no one else located to date except some "strays" in Syria and India) have the unusual motif of 19,21. Not to be outdone, the Williamson ancestor goes one step further and has a motif of 19, 20. Some R1a Norwegians have ancestors who came via Eastern Europe, and a smaller number, like our Williamsons, from Kazakhstan originally.

It apears that the ancient WILLIAMSON Y chromosome originated in Africa, migrated to Asia, then during the Last Glacial Maximum, "over wintered" for a few thousand years is what is today the Ukraine as part of what was known as the Kurgan culture which, with its Indo - European language, spread as far as east Mongolia, and south to India, but is rarely observed west of Eastern Europe (e.g., Poland). After trek over many years and many generations the WILLIAMSON ancestors who had originated in Kazakhstan migrated across the Russian steepes to what is today Western Norway, and around the year 800 AD, with many of his kin and comrades, left his homeland to seek his fortune (or

at least a better life) in other lands, in this case the Shetland Islands.

The above represents my take on the evidence to the year 2005. Instead of must the M17 marker, now we have a host of new markers with M198 being the "core" marker and because it does not involve a deletion as does M17, it is much easier to use on modern chip platforms. The most important split appears to be M283 (Baltic and Eastern Europe) and M93 (Asia). M284 is a derivative of M283 so it is likely that the Norwegian samples are M284 and the Altai are M93 – although this is still an empirical question.

The entire DNA part of the Altai to Norway hypothesis rested on the apparent similarity between Norwegian R1a1 haplotypes, and R1a1 haplotypes of people from the Altai Mountains in Siberia. A process such as convergence could easily explain this finding, so the similarity might be nothing more than coincidence. While not ready to abandon the hypothesis of an Asian connection, as the new data continues to emerge, it becomes more and more unlikely that the original hypothesis can be supported. If this is true, then what is the most up to date evidence? In terms of published information, this would be the Pamjav et al. (2012) article which can be seen here: http://www.familytreedna.com/PDF/New_Y_Chromosome_Binary_Markers_Improve_Phylogenetic_Resolution_Within_Haplogroup_R1a1.pdf . This article, however, does not specifically look at Scandinavian samples so leaves much to be desired in terms of evidence from academic sources. What it does do, however, is to show that in the Uzbek sample 2 were Z280 and 6 were Z93; while among the Mongolian samples, 1 was Z280 and 4 were Z93. Since Z280 (found most commonly in East Slavic areas, and is a "sister clade" to Z284 (in other words the latter is not a derivative of the former), thus we have evidence contrary to my above hypothesis.

In referring to studies by "citizen scientists" we jump light years ahead and to make a long story short, it is a virtual certainty that the Williamson Y is tagged with the marker Z284 which has the same haplotype pattern, and is found almost exclusively in Norwegians, or in areas which were settled by Norwegians (e.g., Iceland). While it will be necessary to test the Williamson Y to confirm this conclusion, I think for the moment we can stand on firm ground in making the link. One of the better articles in this category is: http://www.eupedia.com/europe/Haplogroup_R1a_Y-DNA.shtml.

Autosomal DNA:

Also since 2005, while there has been a flourish of ancient DNA testing from various locations across Eurasia, is that there has been zero testing of ancient DNA from Scandinavians of the Viking period. This stands in sharp contrast to say Neolithic farmers from Sweden; and even early hominid species who interbred with modern humans to leave their genetic trace. There have been Neanderthal and Denisovian genomes sequenced from 50,000 or so years ago. A recent analysis of a fully modern human from what is today Siberia dated to about 26,000 years ago shows the close genetic proximity between this individual (and presumably the group to which he belonged) to modern Northern Europeans, and to some Native Americans such as the Karitiana of South America – but no affinity to East Asians. The most recent paper to

attempt an integration of all this data points to these groups as well as Near East agriculturalists of the Rossen culture in Neolithic Germany, as being the progenitors of modern Europeans.

The present author has had his genome and that of his uncle Dale Williamson tested via 23andMe. The Y-chromosome findings confirms what has been found to date in relation to the Williamson Y being from the haplogroup R1a1a. What is new, and very interesting, is the data from the testing of the 22 autosomes (the Y and X chromosomes being the 23rd or sex chromosomes). Here we see matching segments between my uncle and myself (but not one of my first cousins, daughter of another uncle) with someone whose 4 grandparents were born in Shetland, and as well we all match a Norwegian in this specific region of Chromosome 17. Hence we now have autosomal data from the 22 pairs of chromosomes as well as the Y chromosome to show how the Williamsons are descended from the Norse, as would be suggested based on their Shetland Island ancestry and paternal naming practices.

Here follows the data showing the "Norse autosomal link". First a match on Chromosome 17 between David Faux and his uncle Dale Williamson with John Robertson whose grandparents were all born in Shetland. The genealogy between the two families shows that Dale and John are 4th cousins, and David and John are 4th cousins once removed. The ancestors in common are the great great great grandparents of Dale and John, William Matthewson and Isabella Spence both born Mid Yell, Shetland Islands via their children Gilbert Basil Williamson and Andrina Charlotte Williamson respectively.

Using the Advanced Ancestral Inheritance tool, In the chart below IBD stands for identical by descent, and cM is a measure of the size of the segment based on its probability of recombination at each meiosis.

The above chart gives a rough indication as to where the matching segments are found, but for more specifics the chart below will be of help.

Comparison	Chromosome	Start point	End point	Genetic distance	# SNPs
John Robertson vs. David Faux	17	54000000	76000000	37.7 cM	4562
John Robertson vs. Dale Williamson	17	50000000	76000000	42.3 cM	5521

Another measure of the size of the match is expressed in percentage of the genome. For Dale the match represents 0.57% and for David 0.51% of the genome (not shown here). The size is typical for a 3rd cousin, but could be from a far more distant cousin. Genetics gets very random, in terms of being able to predict a specific relationship based on the percentage, and the number of shared segments, after 2nd cousins. In the chart above, the span of the match is shown in terms of base pairs from the "p tip" of Chromosome 17 – which chromosome in total extends from zero to about 100 million megabites in length.

Other tools at 23andMe allow us to examine the match to see if anyone in their database of individuals who have identified that all 4 grandparents were born in the same country, matches John, Dale and David on this segment. The match would likely reflect not a

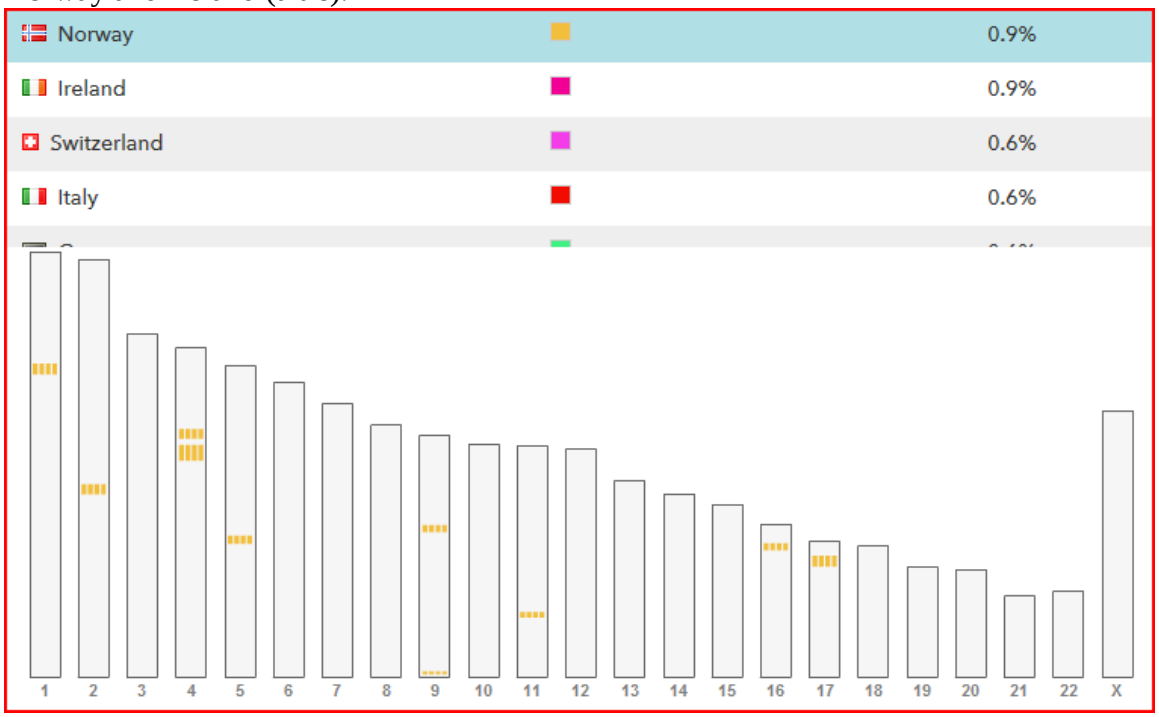
genealogical relationship within the last few hundred years, but more likely a more ancient but difficult to specify connection.

Match on Chromosome 17 between Dale Williamson, his nephew David Faux and someone whose 4 grandparents were all born in Norway.

Dale Williamson: The Counties of Ancestry tool of 23andMe shows the following:

Country	Color	Percent of Dale Williamson's Genome Covered
United Kingdom		5.7%
Norway		0.9%
Ireland		0.9%
Switzerland		0.6%

This shows that out of the 23andMe database, which unfortunately does not include the specific number of individuals with 4 parents born in Norway, these represent 0.9% of the genome of Dale. Hence after the UK, his largest number of matches are from Norway and Ireland (a tie).



Above we see the specific location of the Norway matches across the genome of Dale, including the match on Chromosome 17. If more individuals of Shetland ancestry had tested, there would doubtless be more matches on the same chromosome between Dale, the Shetland descendant, and the person whose ancestry is all from Norway at least to the level of grandparents.

CVS Download:

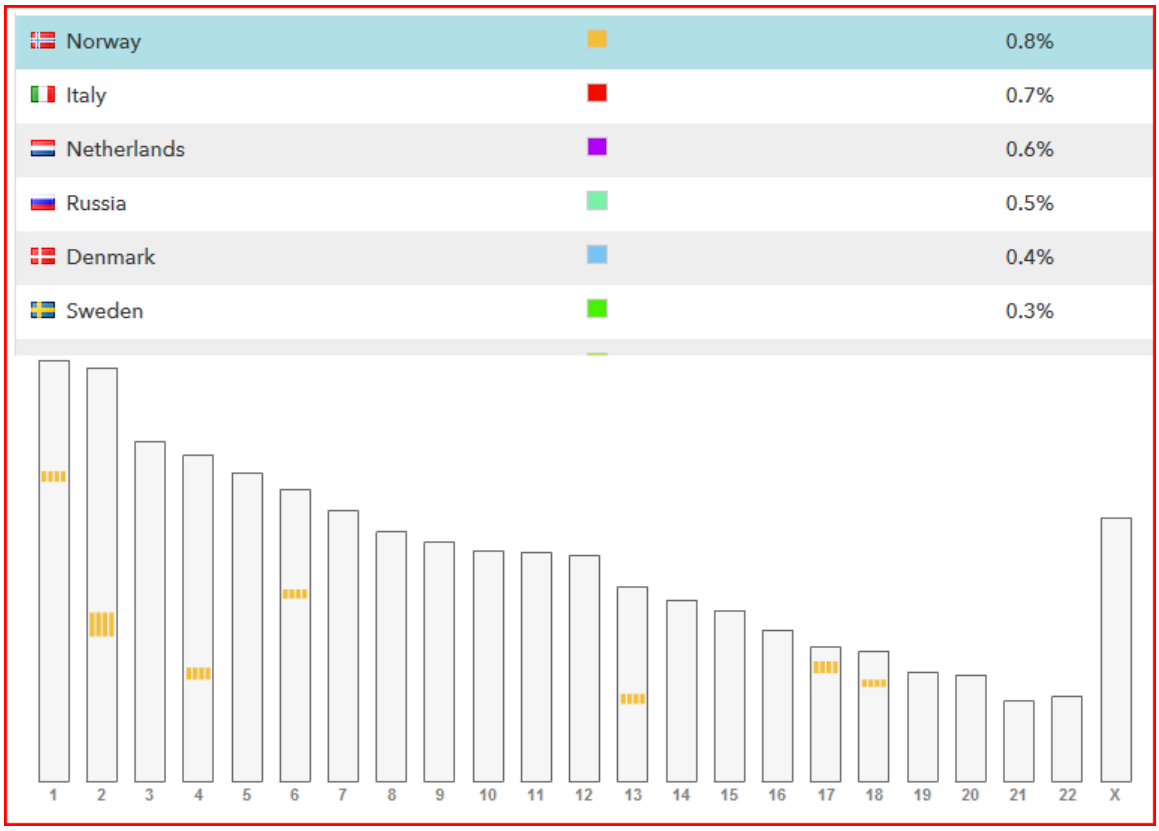
MatchNam	MaternalG	MaternalG	PaternalGr	PaternalGr	MaternalG	MaternalG	PaternalGr	PaternalGr	Chromoso	SegmentS	SegmentE	SegmentL	SegmentLengthInCenti	Morgans
Lawrence	Norway	Norway	Norway	Norway	FALSE	FALSE	FALSE	FALSE	17	64.4	70.9	6.5	11.6	

Here it can be seen that the match with this person of Norwegian descent is from base pair 64,400,000 to 70,900,000. This is a large part of the Williamson match of 50,000,000 to 76,000,000 and all the more amazing since our ancestor in common probably lived back in Viking times. False = answer to whether grandparent was Asheknazi Jewish. What follows is the same data for:

David Faux:

Country	Color	Percent of David Faux's Genome Covered
United Kingdom		6.0%
Ireland		1.5%
Germany		1.0%
Norway		0.8%

Here we see that for David, his second most numerous matches, after the UK, are from Ireland, and the third are from Germany. The latter is consistent with the observation that David tends to have more and larger matches to descendants of his great great great Grandparents Henry Young and his wife Elizabeth Matilda Young, both Colonial Americans but largely of German ancestry (the surname Young was Jung in Colonial New York and New Jersey). So Norway is fourth on David's list compared to his uncles second.



The above chart shows the gold coloured Norway matches for David. It is also noteworthy that after Norway we find the largest number of matches to those with 4 grandparents born in Italy, Netherlands, Russia, Denmark, and Sweden. The differences here between uncle and nephew probably stem from the fact that David's father was largely of East Anglian and Yorkshire (English) heritage. This area was in the Danelaw, and was heavily populated by Viking settlers, largely from what is today Denmark.

CVS Download:

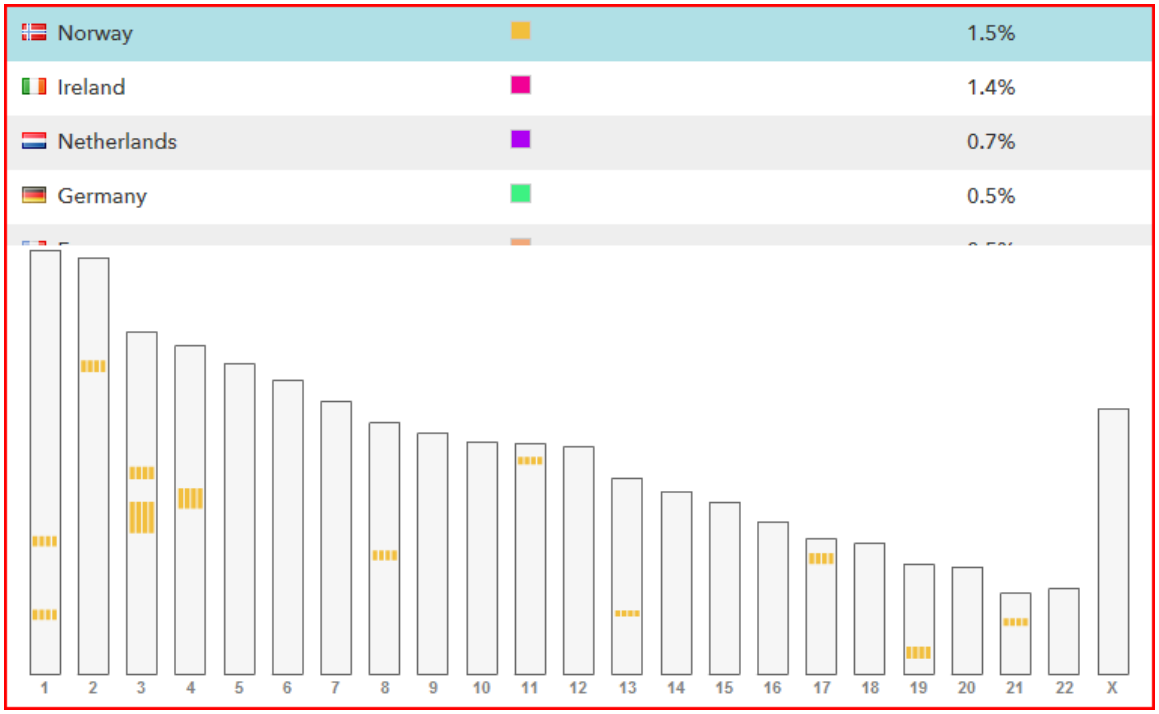
MatchNam	MaternalG	MaternalG	PaternalGr	PaternalGr	MaternalG	MaternalG	PaternalGr	PaternalGr	Chromoso	SegmentS	SegmentE	SegmentL	SegmentLengthInCenti	Morgans
80	Lawrence	Norway	Norway	Norway	Norway	FALSE	FALSE	FALSE	FALSE	17	63.9	70.9	7	12.1

The above chart shows a segment only slightly smaller than that of his uncle in relation to the same person with 4 Norway born grandparents.

John Robertson:

Country	Color	Percent of John Robertson's Genome Covered
United Kingdom		5.7%
Norway		1.5%
Ireland		1.4%
Netherlands		0.7%
Germany		0.5%

John's pattern of country by country matches here is much the same as we see for Dale, although the latter has less percentage of genome from Norway, 1.5% versus 0.9%. This is an interesting observation since Dale is only 1/8 Shetland descent, yet has over half as many Norway matches as John who is of 100% Shetland descent. If there was a separate category of Shetland Islands, doubtless John would see a much higher number of matches than Dale.



CVS Download:

MatchNam	MaternalG	MaternalG	PaternalGr	PaternalGr	MaternalG	MaternalG	PaternalGr	PaternalGr	Chromoso	SegmentS	SegmentE	SegmentLe	SegmentLengthInCenti	Morgans
97	Lawrence	Norway	Norway	Norway	Norway	FALSE	FALSE	FALSE	FALSE	17	64.4	70.9	6.5	11.6

Here we see that John has the same match with Lawrence S. M. as does Dale, and almost identical to that of David. Again we run into slight genetic anomalies. Although all three men have segments that end at precisely the same location, the beginning point shows that the match with David is slightly larger, and that the size of the match is slightly higher in David (6.5 Mb versus 7.0 Mb in length; 12.1 versus 11.6 cM).

Basically what we are looking at in Williamson, Faux and Robertson is Viking DNA, as evidenced by the exact match with a Norwegian along an extensive part of the chromosome where the above Shetland Williamson family descendants match – the Shetland Islands being settled by Norse Vikings, but after 1466, also by incomers from Scotland. The genealogical records show that the Williamsons are ¾ Norse (descendants of the old Norn speaking Norse families), and ¼ Scottish (descendants of Scottish incomers).