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your DNA results
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Kelly

An Autosomal DNA Case Study

www.irishorigenes.com



A handwritten signature in black ink, appearing to read 'Tyrone Bowes', is positioned above the printed name.

Dr Tyrone Bowes
5th September 2019

INTRODUCTION

There are a number of commercial ancestral DNA tests that can be used to explore one's ancestry. By far the most popular is the 'autosomal test' which sheds light over **all** of one's recent ancestral lines. With autosomal DNA testing one will typically match many individuals (both male and female) and making sense of those relationships can be quite challenging. However, as with every DNA test the same golden rule applies; the more DNA that two people share the more recent their shared (paternal or maternal) ancestor once lived. In addition, many of one's autosomal matches will reveal surnames and placenames associated with their family tree, and those surnames and locations can hold clues as to where the various branches in one's own ancestral tree originated. The challenge of modern autosomal DNA test analysis is linking a common location revealed in the autosomal DNA test results with a particular ancestral surname.

INTERPRETING THE AUTOSOMAL RESULTS

An examination of the test subject's 'autosomal' DNA test results revealed 4,428 genetic relatives, 1,862 of whom record details of their ancestral surnames or locations, see **Figure 1**. What is quite striking is that the locations revealed by the test subject's 'autosomal' genetic relatives are **NOT RANDOM**; given its population size, Ireland features most prominently, see **Figure 1**.

A

FamilyFinder STATS	
Matches	4428
Ancestral details	1862
Percentage	42

B

Country	Frequency	Percentage
Ireland	600	32.2
Scotland	182	9.8
England	289	15.5
Wales	56	3.0
Germany	196	10.5
France	96	5.2
Spain	7	0.4
Italy	24	1.3
Norway	26	1.4
Poland	23	1.2
Finland	7	0.4
Russia	41	2.2

Figure 1: Family Finder Stats. Approximately 42% of the test subject's autosomal genetic matches record some sort of ancestral information (surname or location, **panel A**). The locations revealed by these genetic relatives are **NOT RANDOM**, compared to a selected number of countries Ireland (where the test subject's paternal ancestral connections lie) feature prominently, **panel B**.

The Ancestral link with Ireland

The locations recorded within Ireland by Mr Kelly’s autosomal genetic relatives are not random, with the counties of Antrim and Donegal in Ulster, the bordering counties of Limerick and Tipperary in Munster, Dublin in Leinster, and Mayo in Connacht featuring most prominently, see **Figure 2**. An examination of the ancestral surnames revealed among the test subject’s autosomal matches with recorded links within Antrim, Donegal, Limerick, Tipperary and Mayo reveals that they are dominated by Gaelic Irish and Norman surnames.

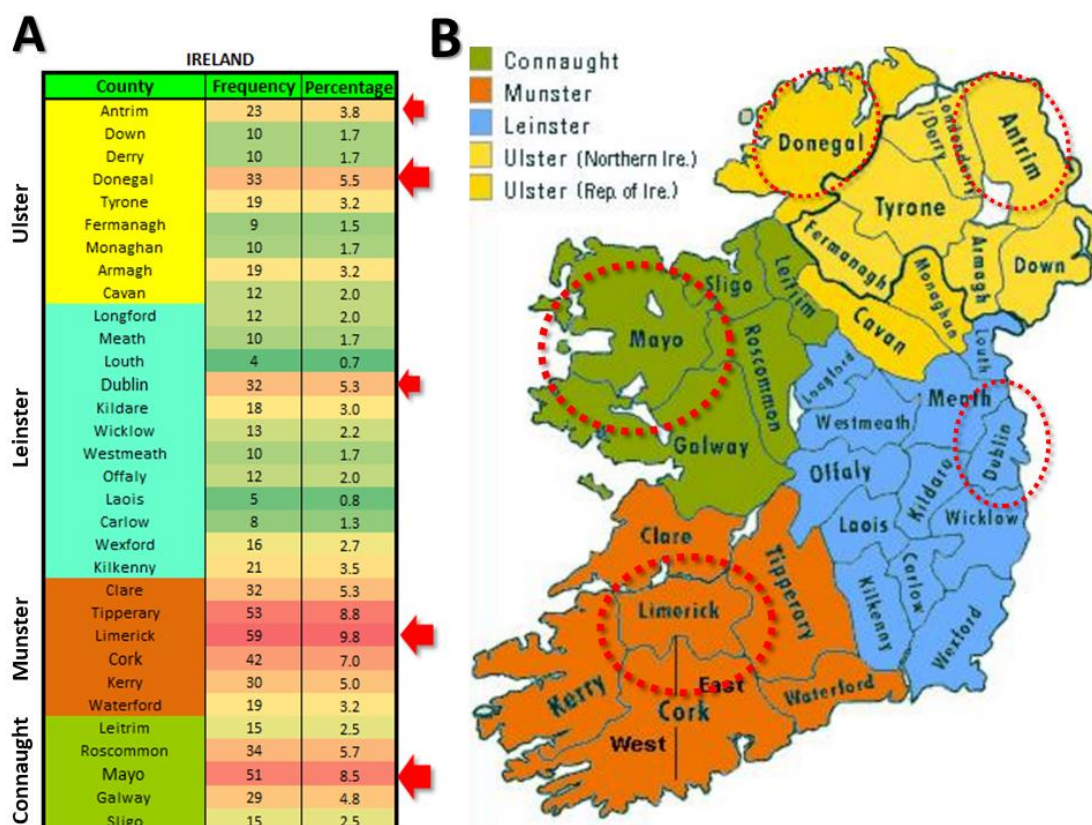


Figure 2: Autosomal matches reveal ancestral connections with a number of Irish locations. An examination of the Irish counties (**panel A**) revealed among the test subject’s genetic relatives reveals that Antrim and Donegal in Ulster, Limerick and Tipperary in Munster, Dublin in Leinster, and Mayo in Connacht feature most prominently (**red arrows panel A, red broken circles panel B**). An examination of the ancestral detail recorded by the test subject’s genetic relatives reveals that surnames of Gaelic Irish and Norman surnames dominate among those with links within Limerick/Tipperary and Mayo, while surnames of Gaelic Irish origin dominate within Donegal. The ancestral connections with Dublin and Antrim are a result of more recent migrations to Ireland biggest cities (Dublin and Belfast respectively).

The Kelly Surname in Ireland

Kelly is the second most common surname in Ireland. The 1911 census of Ireland revealed 45,832 individuals named ‘Kelly.’ Distribution mapping reveals that those individuals were not distributed evenly throughout Ireland, but concentrate within specific locations, see **Figure 3**. Since surnames arose in an agricultural based society, farmers with each surname can still be found concentrated in the area where their surname first appeared, or in the area where one’s ancestors first settled. An examination of the distribution of farmers named Kelly (Catholic, male,

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heads of household in 1901) reveals that they were not distributed evenly throughout Ireland, but concentrated in at least 39 specific locations, approximately half of which are located in, or near, areas of permanent Norman settlement, see **Figure 4** and **5**. The test subject's paternal ancestry is linked to 1 of 22 distinct groups of Kelly farming communities found within Ireland.

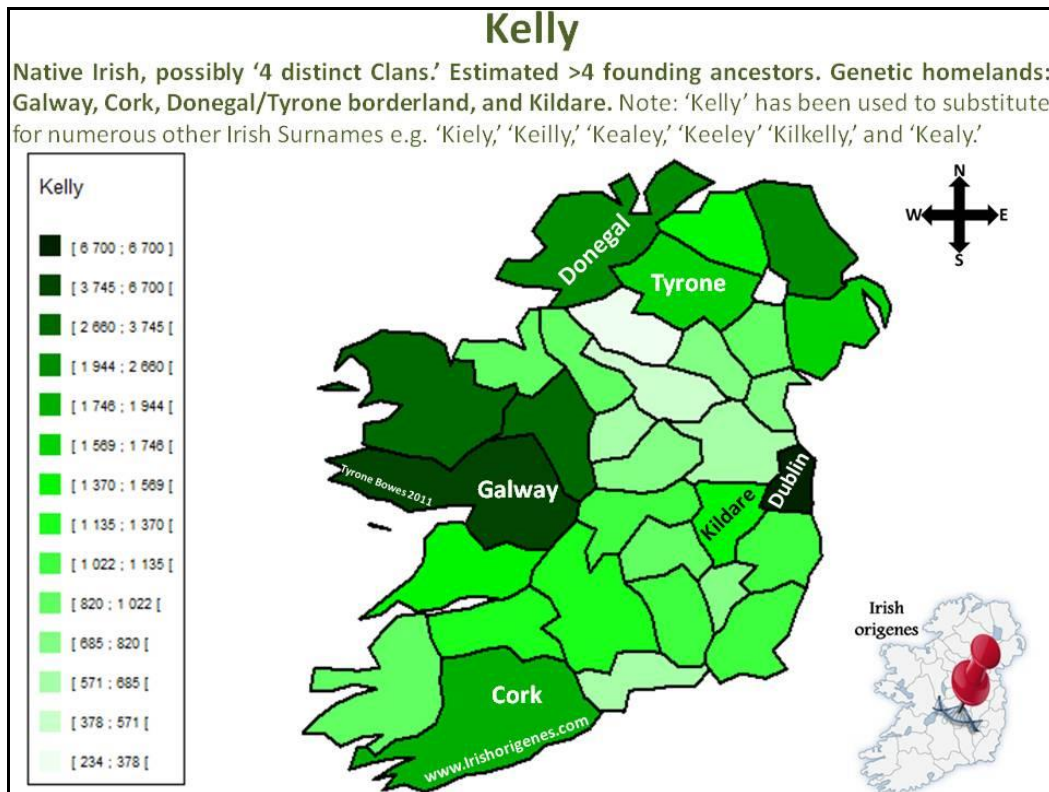


Figure 3: Distribution mapping of the Kelly surname in Ireland. Although census data reveals that Kelly is the second most common Irish surname, an examination of the distribution of individuals named Kelly in 1911 reveals that the surname is not distributed evenly throughout Ireland but concentrates in specific counties.

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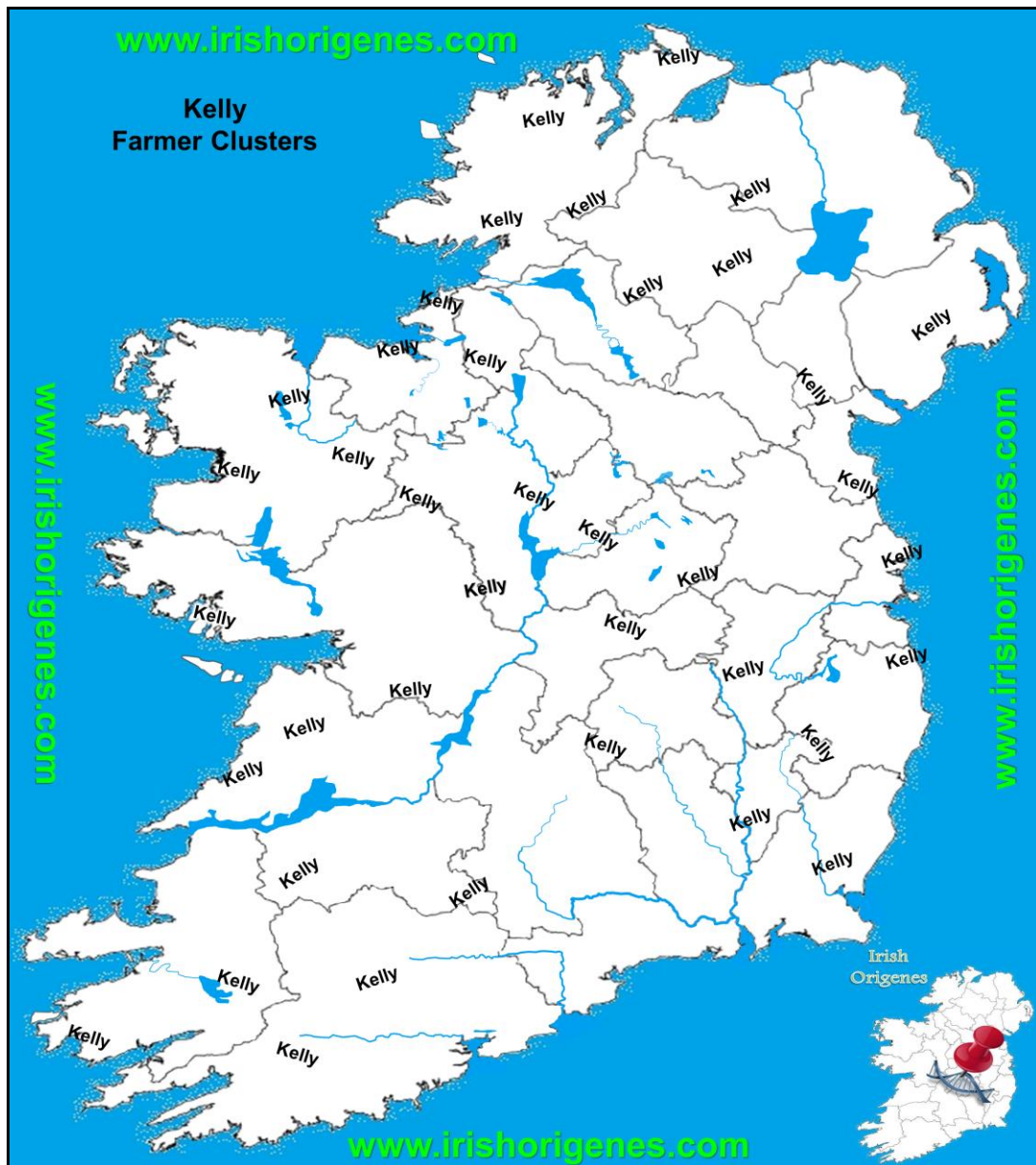


Figure 4: The Kelly farming community. An examination of the distribution of farmers named Kelly in early census data revealed at least 39 distinct groups within Ireland. Each surname is positioned in the location where farmers (Catholic/male/heads of household) with that surname concentrate in early census data. The most common spelling is detailed in each location.

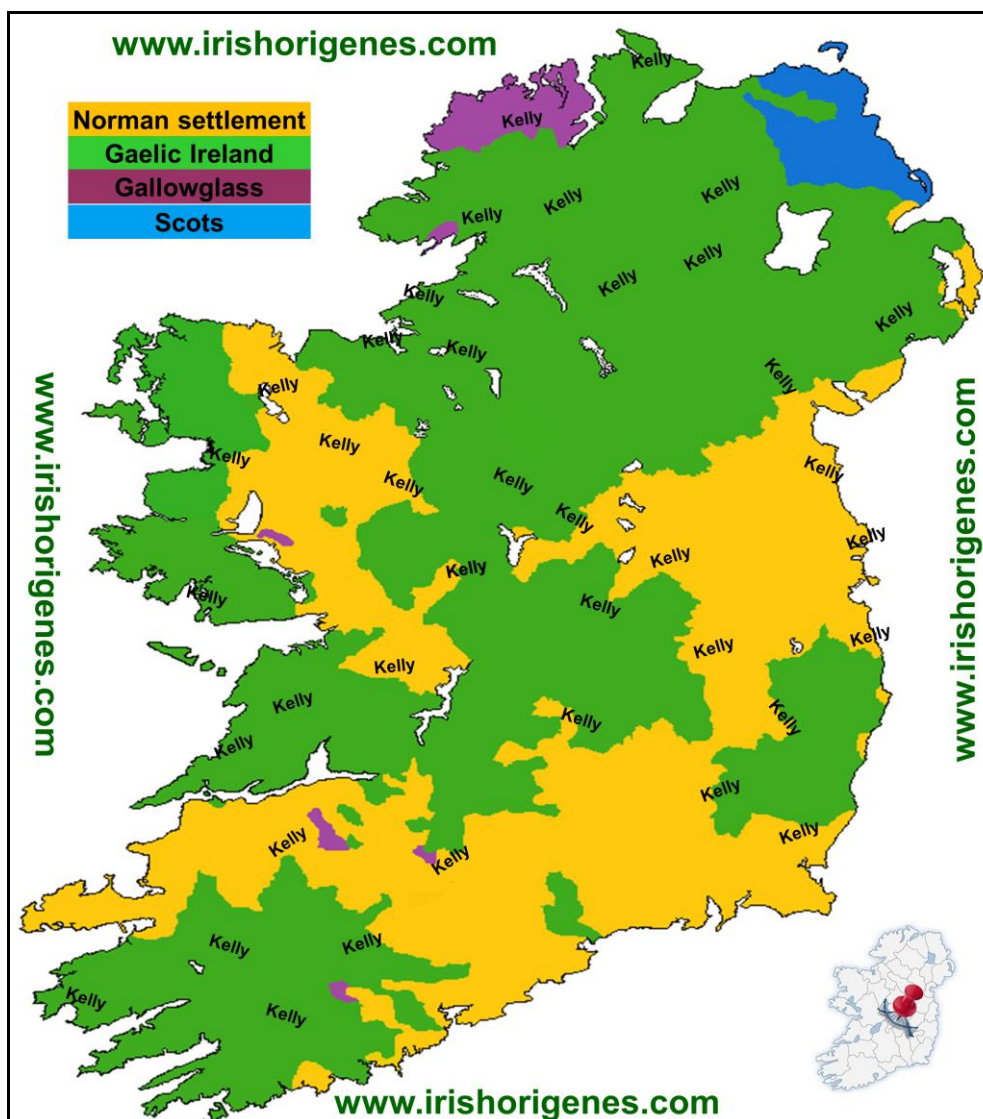


Figure 5: Areas of permanent Norman settlement within Ireland. Where the Normans settled permanently they built their castles and towerhouses. The map of permanent Norman settlement was reconstructed based on the location of castles and towerhouses that were permanently occupied by Norman families. Since the test subject shows DNA evidence that his paternal Kelly ancestors resided in or near an area of permanent Norman settlement, his paternal ancestry is linked to one of approximately 22 locations within Ireland.

LINKING AN ANCESTRAL SURNAME WITH A DNA LOCATION

The borderlands of Limerick and Tipperary

The challenge of autosomal DNA analysis is linking a location revealed in the results with one of the test subject's ancestral surnames. Although Kelly is the second most common surname in Ireland, family history connects the test subject's earliest paternal Kelly ancestors with the town of Nenagh in North County Tipperary; an area which also emerged among the test subject's autosomal DNA test results, see **Figure 2**. The ancestral detail recorded by the test subject's autosomal genetic relatives are not random; they reflect the relationships that developed among his various ancestral lines living in specific locations within Ireland; many of whom also record ancestral surnames and locations. One can explore that detailed detail revealed among those genetic relatives with recorded ancestral links within Limerick and Tipperary to

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see if they localise within a specific area. That process reveals that his closest genetic relatives all record ancestral links within the borderlands of Tipperary and Limerick; an area which lies to the south of Nenagh town, see **Figure 6**. An examination of the surnames associated with the Limerick and Tipperary borderlands reveals an area dominated by Gaelic Irish and Norman surnames; many of which appear among the ancestral detail revealed by the test subject's autosomal genetic relatives, see **Figure 7**. A closer inspection of the distribution of Kelly farmers in the Limerick and Tipperary borderlands reveals that they concentrate to the north, east and south of the Silvermine Mountains, see **Figure 8**. The scattered nature of the Kelly farmers is a direct result of the Norman conquest of Ireland which saw Gaelic Clan chief replaced by Norman Lords. However, Ireland is rich in placenames, many of which (townlands) predate the Norman invasion and are named after the Irish Clans that once lived there. An examination of Irish placenames and townlands reveals a number surrounding the Silvermine Mountains, most notably the townlands of 'Clonkelly' (*Clan Kelly*), 'Knockakelly' (*Kelly's Hill*) and 'Gortkelly' (*Kelly's land*) which lie to the south of Nenagh, see **Figure 8** and **9**. The test subject's autosomal DNA results reveal that his Kelly paternal ancestors were living in the shadow of the Silvermine Mountains and that his Kelly Clan emerged from that area that lay between the townlands of Clonkelly, Knockakelly and Gortkelly in North Tipperary.

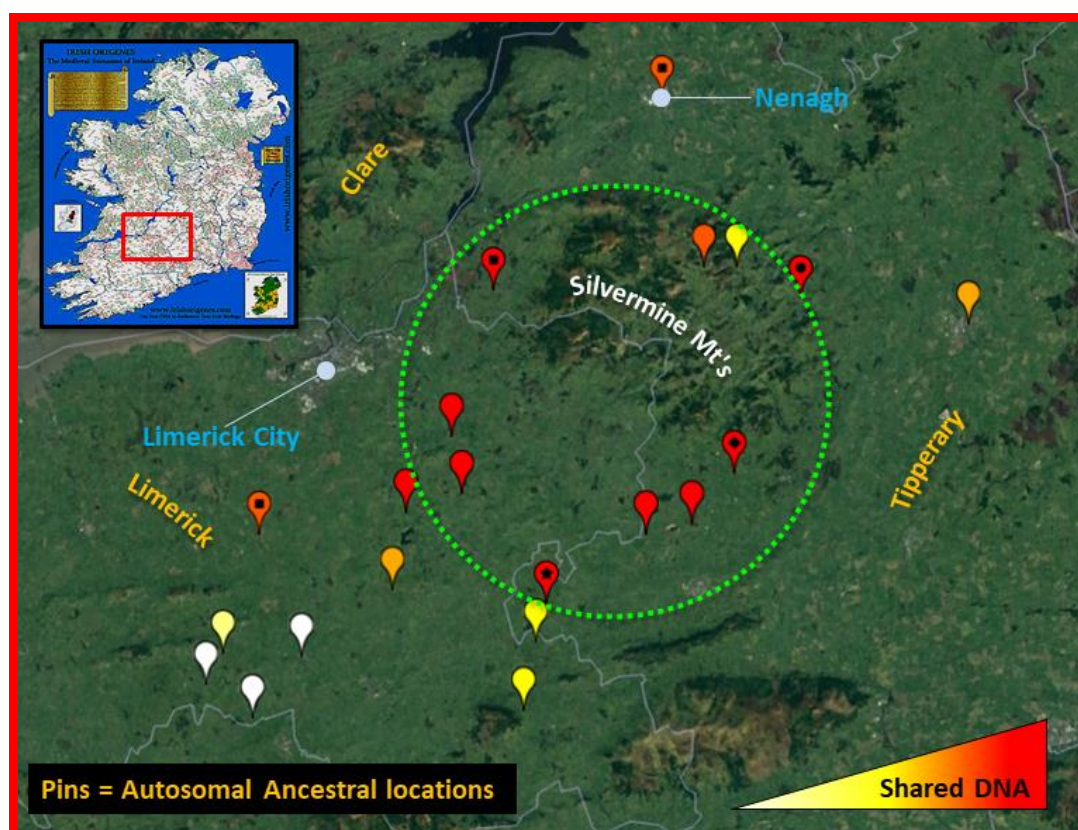


Figure 6: Limerick and Tipperary ancestral locations recorded by Mr Kelly's Autosomal genetic relatives. By plotting the ancestral locations revealed among the test subject's closest autosomal genetic relatives it reveals a clear ancestral link with the borderlands of Limerick and Tipperary which lie to the south of Nenagh town (**green broken circle**). Each pin is positioned in the location where an autosomal genetic relative records an ancestor. Pin colour indicates the amount of shared DNA (the more DNA shared the closer the shared ancestry).

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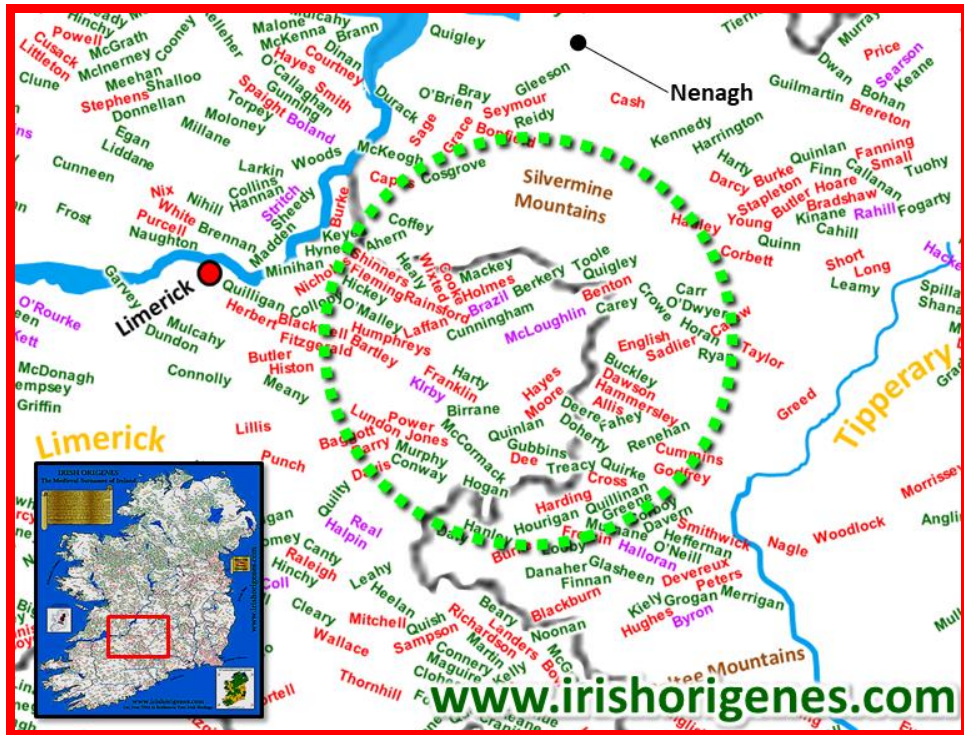


Figure 7: The Pre-Plantation surnames of the Limerick and Tipperary borderlands. An examination of the surnames associated with the Limerick and Tipperary borderlands which dominates among the test subject's autosomal matches reveals an area dominated by Gaelic and Norman surnames, many of which appear among the ancestral detail revealed by the test subject's closest autosomal DNA matches. The Irish Surnames map details where farmers with each surname concentrate in early census data. The most common spelling is detailed.

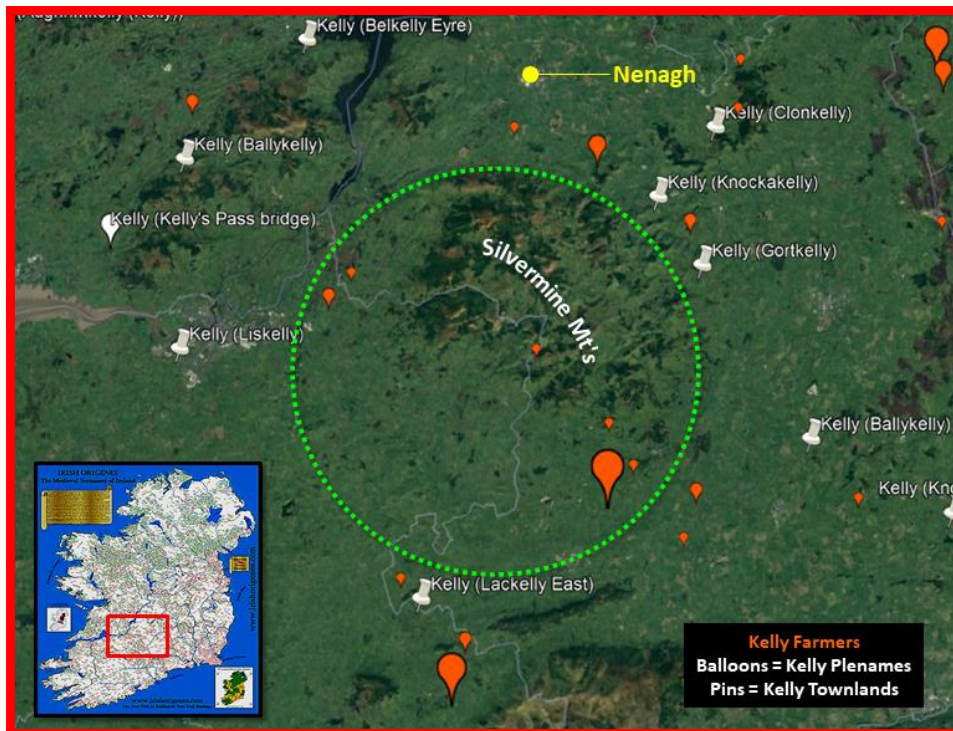


Figure 8: The Kelly farming community, townlands and placenames of the Limerick and Tipperary borderlands. A closer inspection of the distribution of Kelly farmers reveals that they concentrate in an arc that stretches from Limerick City to the south of the Silvermine Mountains; an area also rich in Kelly townlands and placenames.



Figure 9: Kelly Townlands that lie to the south of Nenagh town. Although the Normans may have scattered the Kelly Clan of the Silvermine Mountains, the townlands record the names of the Clans and Families that once lived there. The farmland to the south of Nenagh town is rich in Kelly townlands and these townlands reveal that the test subject's Kelly ancestors originated in the farmland that encompassed the townlands or Knocknakelly, Clonkelly and Gortkelly.

Mayo and Donegal

County Mayo gave the second strongest signal among the test subject's autosomal DNA results. An examination of the ancestral locations revealed by his autosomal DNA genetic relatives with recorded ancestral links within Mayo revealed that they clustered in the south near the border with Galway; in an area that was also heavily colonised by Normans, see **Figure 10** and **11**. These results indicate that at least one of the test subject's Irish ancestors (almost certainly his Beirne ancestors) originated from the area of County Mayo that lies to the east of Westport town.

In contrast, too few of the test subject's (33) autosomal DNA genetic relatives revealed ancestral locations within Donegal, and hence it is not possible to narrow the area from which his Donegal ancestral line may have originated. However, as more and more people participate in autosomal DNA testing, locations should be revealed which will help pinpoint an origin within County Donegal.

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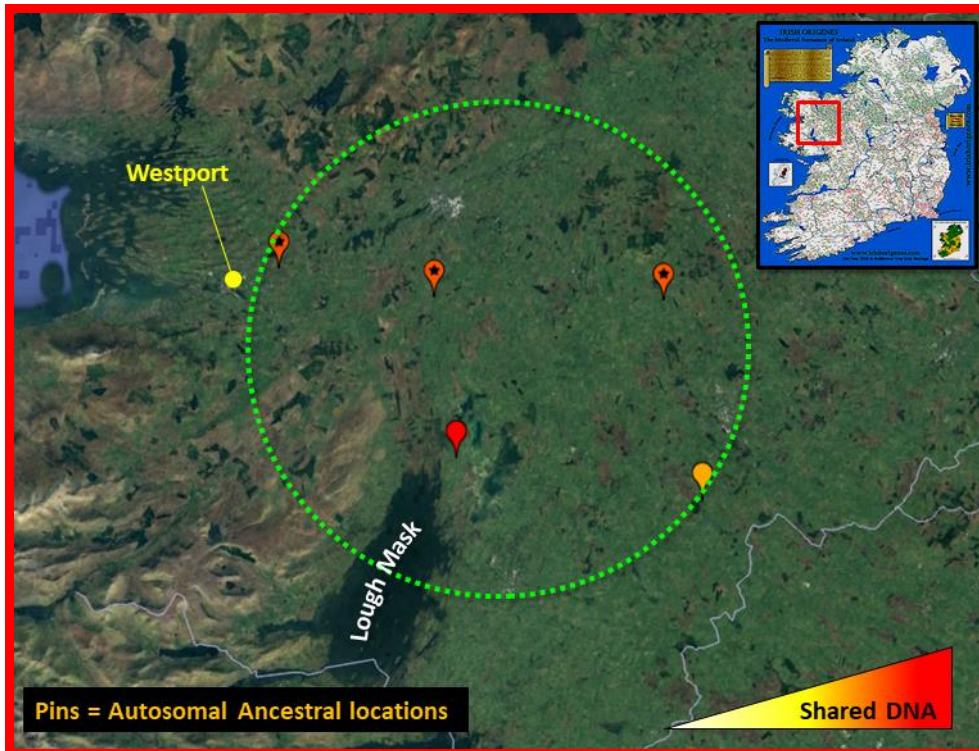


Figure 10: Mayo ancestral locations recorded by Mr Kelly's Autosomal genetic relatives. Although only 3 of the test subject's autosomal DNA genetic relatives with ancestral links record towns or villages associated with their Mayo ancestors, those locations are situated close together within South County Mayo (green broken circle). At least one of the test subject's Irish ancestral lines originated from the farmland that lay to the east of Westport town.



Figure 11: The surnames of South Mayo. An examination of the Pre-Plantation surnames associated with South Mayo reveals a mix of Gaelic Irish and Norman origin. At least one of the test subject's Irish ancestral lines connects back to the farmland that lies to the east of Westport town (green broken circle). The Irish Surnames map details where farmers with each surname concentrate in early census data. The most common spelling is detailed.

Confirming an ancestral link to an identified area

Autosomal DNA testing of Kelly farmers in the farmland that lies to the south of Nenagh town would confirm the ancestral connection to that location. Autosomal DNA testing of Beirnes from the area to the east of Westport town would confirm the ancestral connection to that location. As more and more autosomal genetic relatives with ancestral links with County Donegal emerge, it will become possible to identify which of the test subject's ancestral lines link back to that area, and narrow down the ancestral origin within County Donegal.

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