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Case Study
Pinpointing the Keegan Paternal Ancestral Genetic Homelands

www.irishorigenes.com

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INTRODUCTION

A simple painless commercial ancestral Y chromosome DNA test will potentially provide one with the names of many hundreds of individuals with whom one shares a common male ancestor, but what often perplexes people is how one can match lots of individuals with many different surnames? The answer is quite simple. Roughly 1,000 years ago one's direct medieval male ancestor, the first for example to call himself 'Keegan' was living in close proximity to others with whom he was related but who inherited other surnames like Egan, Heaney, Coffey and Quinn. Given that 1,000 years have passed since paternally inherited surnames were first adopted, there will be many descendants of those individuals some of whom will today undergo commercial ancestral Y-DNA testing. Hence the surnames of one's medieval ancestor's neighbours will be revealed in today's Y-DNA test results.

Surnames in Ireland can still be found concentrated in the areas where they first appeared, or in the area where ones ancestors first settled. One can therefore use census data to determine the origin of the surnames that appear in one's Y-DNA results, identifying an area common to all, and reveal one's '**Paternal Ancestral Genetic Homeland**.' The paternal ancestral genetic homeland is the small area (usually within a 5 mile radius) where one's ancestors lived for hundreds if not thousands of years. It is the area where one's ancestor first inherited his surname, surrounded by relatives who inherited others. It is the area where ones ancestors left their mark in its placenames, its history, and in the DNA of its current inhabitants. Since modern science can pinpoint a paternal ancestral genetic homeland it can also be used to confirm it by DNA testing individuals from the pinpointed area.

Notes of caution!

1. In Ireland each of the estimated 1,500 distinct surnames had a single founding ancestor, that's an estimated 1,500 Adams from whom anyone with Irish ancestry can trace direct descent. But science has demonstrated that only 50% of individuals with a particular Irish surname will be related to the surnames founding ancestor, the other 50% of males will have an association that has arisen as a result of what are called 'non-paternal events,' usually a result of adoption or maternal transfer of the surname.
2. Often people are looking for their DNA results to trace back to a specific area. One must remember that the results reflect one's ancestor's neighbours from around 1,000 years ago. As a result if your recent Irish ancestors were descended from 9th Century Viking raiders, 12th Century conquering Normans, or 16th Century Planters, your DNA results will reflect earlier English, Scottish, Welsh, and possibly Scandinavian origin. I have estimated that only 60% of those with Irish ancestry are related to the pre-Christian Celtic tribes of Ireland. One must approach this process with an open mind!

Interpreting the Y-DNA test results

To pinpoint a paternal ancestral genetic homeland one must first identify the surnames that appear as one's closest genetic matches upon commercial ancestral Y-DNA testing. Those surnames, particularly one's that recur among one's closest Y-DNA results, will typically reflect the surnames of one's medieval ancestral neighbours. Mr Keegan's closest and most frequent genetic surname matches as revealed by commercial ancestral Y-DNA STR and SNP testing are revealed in see **Figures 1** and **2**.

111 Marker Matches							
Genetic Distance	Last Name	Earliest Known Ancestor	Y-DNA Haplogroup	Terminal SNP	Match Date	Big Y STR Differences	Big Y STRs Compared
5	Keegan	Keegan, Ireland	R-FT94609	FT94609	5/17/2019	2	624
10	Keegan	Michael Keegan, b. May 8 1820 d. Nov 4 1893	R-M269		12/29/2017		
67 Marker Matches							
Genetic Distance	Last Name	Earliest Known Ancestor	Y-DNA Haplogroup	Terminal SNP	Match Date	Big Y STR Differences	Big Y STRs Compared
2	Keegan	Keegan, Ireland	R-FT94609	FT94609	12/29/2017	2	624
6	Egan	Denis Egan, b. c 1820, D 23 May 1870 Limerick	R-M269		12/29/2017		
6	Egan	Denis Egan, b. abt 1820, D 23 May 1870 Limerick	R-M269		12/29/2017		
6	Egan	Martin Egan, Dorrha, Tipperary	R-M222	M222	12/29/2017		
6	Egan	Denis Egan, b. abt 1820, D 23 May 1870 Limerick	R-P25	P25	12/29/2017		
7	White	William Hardy White	R-M222	M222	1/13/2019		
7	Bell	James Bell b. 1869 Longtown, Cumberl Eng - illegit	R-M222	M222	12/29/2017		
7	*Daley*	*Peter Francis Daley, b 1920 and d. 2004, adopted*	*R-M269*		*12/29/2017*		
7	Egan	Denis Egan, b. abt 1820, D 23 May 1870, Limerick	R-M269		12/29/2017		
7	*Daley*	*Peter Daley, b 1920 adopted*	*R-M269*		*12/29/2017*		
7	Coffey		R-M269		12/29/2017		
37 Marker Matches							
Genetic Distance	Last Name	Earliest Known Ancestor	Y-DNA Haplogroup	Terminal SNP	Match Date	Big Y STR Differences	Big Y STRs Compared
0	Keegan	Keegan, Ireland	R-FT94609	FT94609	10/4/2017	2	624
3	Coffey		R-M269		10/4/2017		
3	Egan	Martin Egan d c1850, Dorrha, Co. Tipperary	R-M269		10/4/2017		
3	Egan	Martin Egan, Dorrha, Tipperary	R-M222	M222	10/4/2017		
3	Egan	Martin Egan, Dorrha, Tipperary	R-M269		10/4/2017		
3	Egan	Martin Egan, d. c 1850, Dorrha, Co. Tipperary	R-M269		10/4/2017		
4	Basheerud-Deen		R-M269		10/4/2017		
4	Coffey	Coffey	R-M269		10/4/2017		
4	*Daley*	*Peter Daley, b 1920 adopted*	*R-M269*		*10/4/2017*		
4	*Daley*	*Peter Francis Daley, b 1920 and d. 2004, adopted*	*R-M269*		*10/4/2017*		
4	Eagan		R-M269		10/4/2017		
4	Egan	Denis Egan, b. abt 1820, D 23 May 1870 Limerick	R-P25	P25	10/4/2017		
4	Egan	Egan, Ireland	R-M269		10/4/2017		
4	Egan	Murty Roe Egan, Kiltimagh, Mayo late 17th C	R-M269		10/4/2017		
4	Egan	Denis Egan, b. c 1820, D 23 May 1870 Limerick	R-M269		10/4/2017		
4	Egan	Denis Egan, b. abt 1820, D 23 May 1870 Limerick	R-M269		10/4/2017		
4	Higgins	Michael Higgins, b. Apr 1846	R-BY198	BY198	10/4/2017		
4	Mannion	Patrick Mannion 1760 -1830, Ballinastack, Galway	R-BY198	BY198	10/4/2017		
4	Nelson	John Nelson	R-M269		10/4/2017		
4	Waugh	Unknown	R-Y66755	Y66755	2/15/2019	15	654
4	White	William Hardy White	R-M222	M222	5/4/2018		

Figure 1: *Mr Keegan's closest genetic surname matches as revealed in the Y-DNA STR database. The more Y-DNA STR markers two people share; the more recent their shared paternal ancestor once lived. The test subject's closest genetic surname matches are* ***NOT RANDOM****; he matches others named Keegan (**red arrows**). Keegan is an Irish surname, and the dominance of other Irish surnames, some of which like Egan (**yellow arrows**) and Coffey (**purple arrows**) recur among his matches, together with genetic relatives with earliest recorded ancestral locations within Ireland; indicates an Irish paternal origin. The test subject also tested positive for the Irish R-M222 paternal genetic marker which first appeared in Ireland before spreading into Scotland (which explains the scattering of Scottish-associated surname matches). Highlighted font indicates each surnames associated ethnicity, or location of an earliest paternal ancestor: Irish/Ireland, Scottish, Irish/Scottish.*

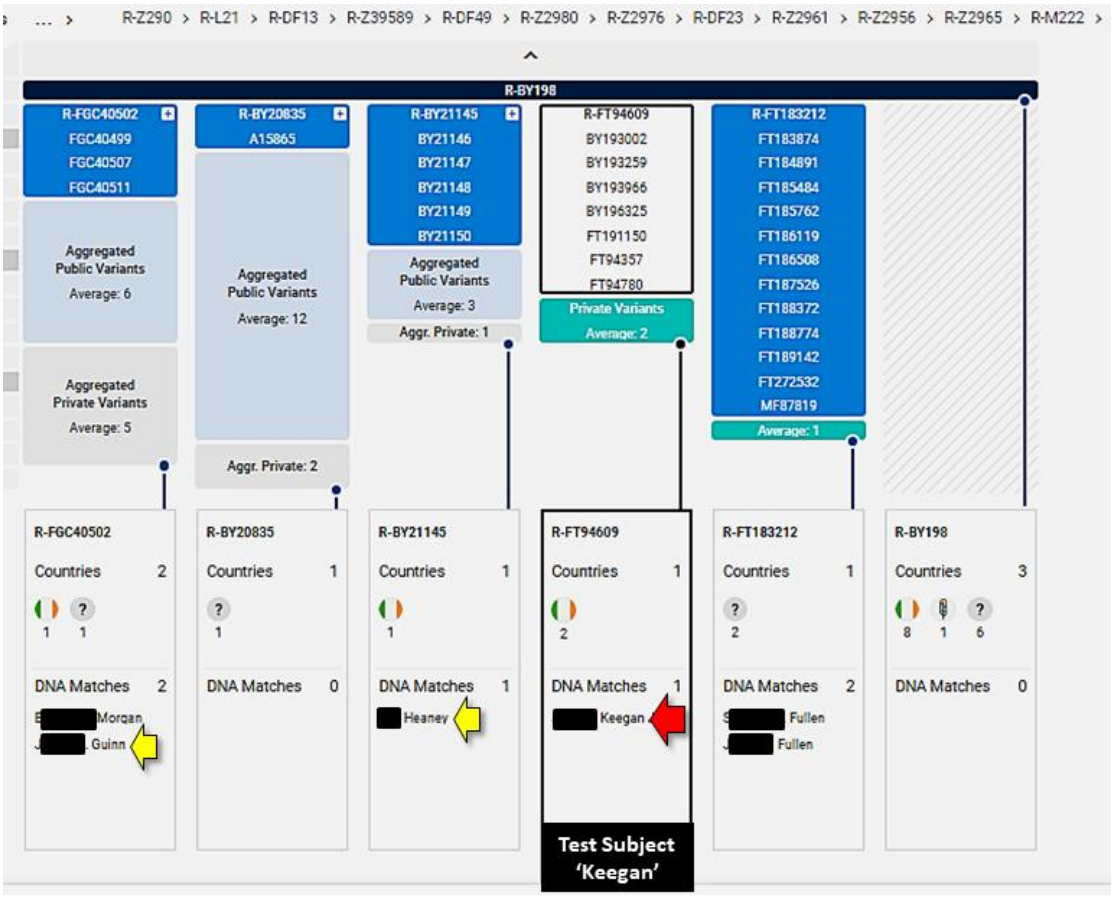

Figure 2: *Block display of Mr Keegan's closest BigY SNP matches. While the STRs examined in the Y-DNA111 test are prone to replication or deletion with each generation, the SNPs explored in BigY testing are far more permanent mutations. BigY SNP testing offers a more accurate glimpse of the precise chronological development of surnames among a tribal group of related males. The test subject is a close SNP match to another Keegan (**red broken box**). His closest BigY matches also include others with Irish surnames like Heaney and Guinn (**yellow arrows**).*

Upon commercial ancestral Y-DNA testing the test subject matched other individuals named 'Keegan' who tested independently, see **Figures 1** and **2**. This indicates that the test subject is descended from a Keegan-Adam; literally the first male (Adam) to take that surname who lived approximately 1,000 years ago when paternally inherited surnames became common. Keegan is an exclusively Irish surname, and the dominance of exclusively Irish surnames among the test subject's closest Y-DNA genetic matches are conclusive proof of a most recent paternal origin within Ireland, see **Figures 1** and **2**. In addition, the test subject's Y-DNA results reveal that he carries the R-M222 paternal genetic marker which first appeared in Northwest Ireland before spreading into Scotland, see **Figure 1**.

The Keegan Surname

The 1911 census of Ireland revealed over 3,000 individuals named 'Keegan.' Those individuals were not scattered uniformly throughout Ireland but concentrated within specific counties, 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 areas where one's ancestors first settled.

Distribution mapping of Irish farmers named 'Keegan' reveals 6 distinct clusters within Ireland, three of which are located within areas where the test subject's R-M222 marker predominates in the local population, see **Figure 4**. This indicates that there are potentially 3 genetically distinct R-M222^{+ve} Keegan clans with whom the test subject may share common ancestry with.

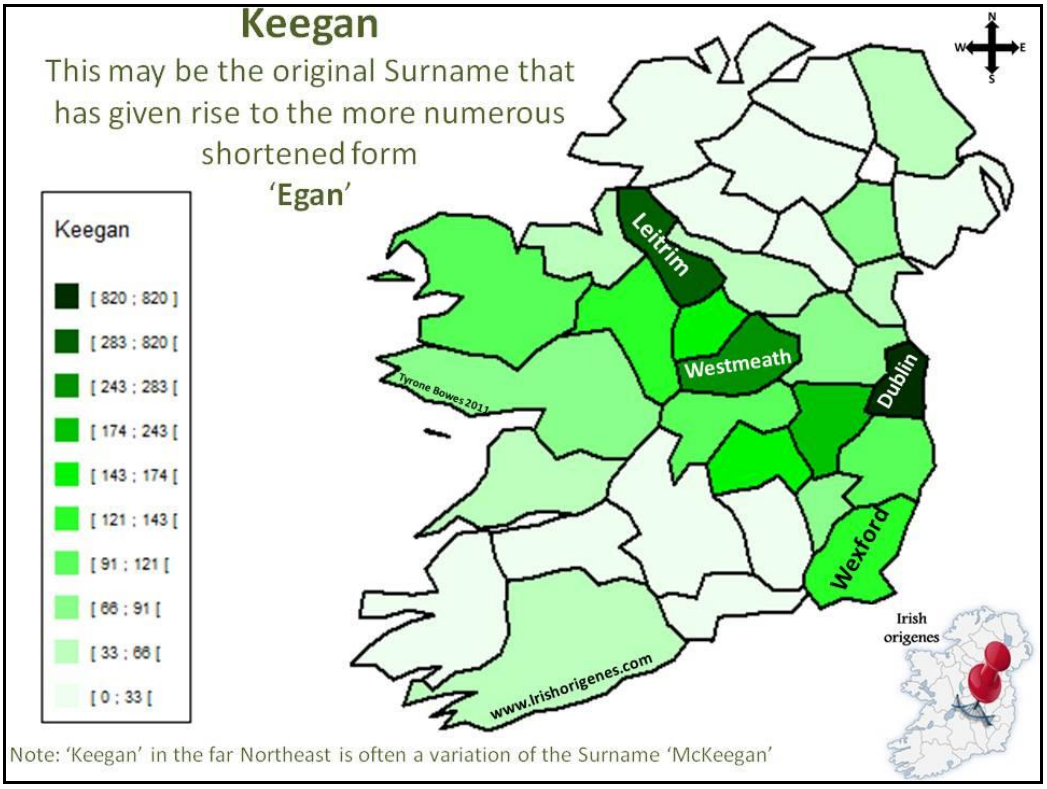

Figure 3: *Distribution mapping of the Keegan surname in Ireland. An examination of the distribution of all individuals named Keegan in 1911 reveals that they are not scattered uniformly but concentrate within distinct Irish counties.*

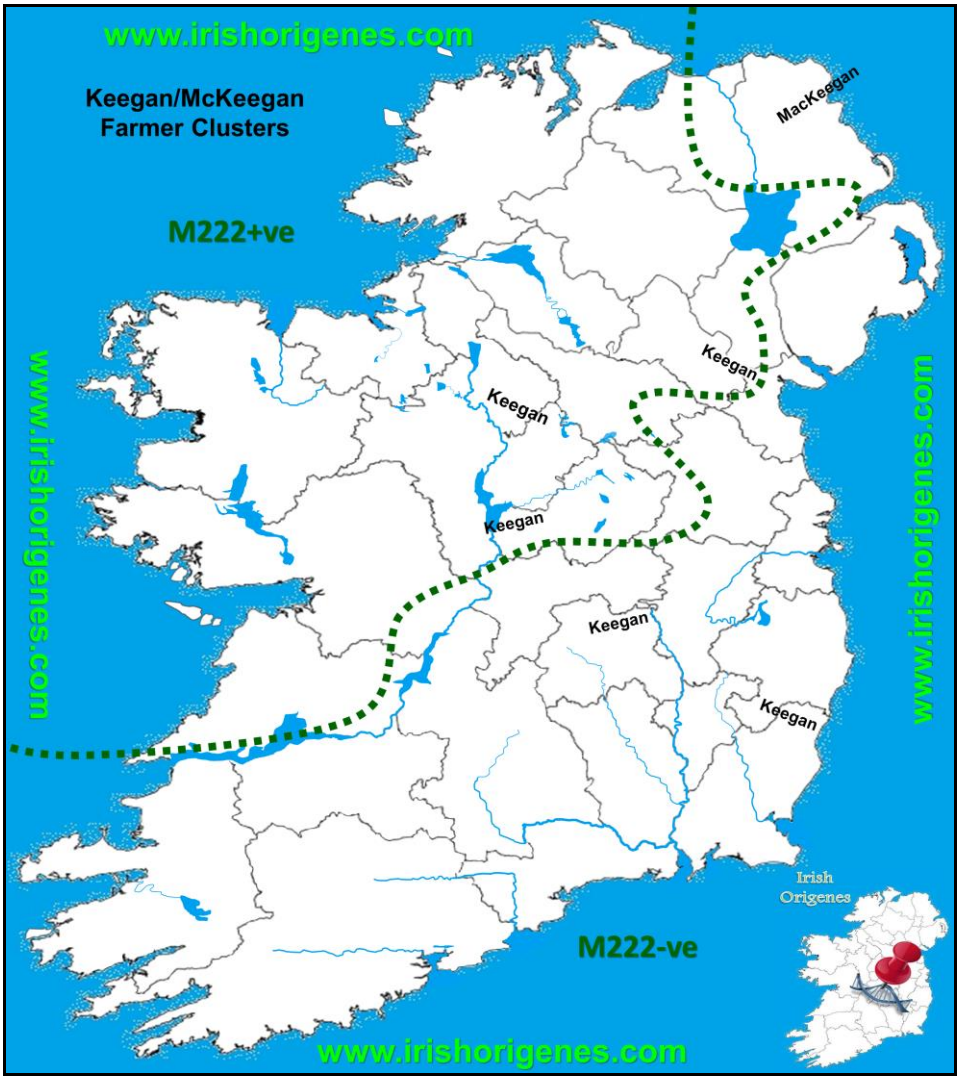

Figure 4: *Distribution of Irish farmers named 'Keegan.' An examination of the distribution of farmers named 'Keegan' reveals 6 distinct groups, 3 of which are found in areas where the test subject's R-M222 marker predominates in the local population. Each group potentially represents a genetically distinct Irish clan; although some may be related and arose due to migration. Each surname is positioned in the location where farmers with that surname concentrated in early census data. The most common spelling is detailed in each location.*

A Paternal Ancestral link with the Irish Midlands

The method of using genetic surname matches as revealed by commercial ancestral Y-DNA testing to pinpoint one's paternal ancestral genetic homeland works by exploiting the link between the Y chromosome, surname and land; which are typically passed from father to son through the generations. In the absence of a link to the land the process becomes more challenging. The link with the land is greatest amongst the farming community, and since farmers in Ireland can still be found farming the lands where their ancestor lived when he first inherited his surname, or where one's ancestor first settled within Ireland, one can plot where farmers with the surnames that appear in one's Y-DNA results originate, and identify an area common to all. This means that upon commercial ancestral Y-DNA testing a 'McKeegan' from County Antrim will be a Y-DNA genetic match to individuals with surnames like McNeill, McDonald and McKillop; surnames associated with the far

northeast of Ireland. In contrast, a 'Keegan' from Wexford will upon Y-DNA testing be a match to males named O'Toole, Byrne and Kavanagh; surnames associated with the far southeast of Ireland. Hence it is the test subject's closest Y-DNA genetic surname matches which will reveal where his funding paternal 'Keegan-Adam' ancestor once lived.

Commercial ancestral Y-DNA testing reveals that the Egan, Coffey and Heaney surnames dominate among the test subject's closest STR and SNP matches, see **Figures 1** and **2**. Distribution mapping of farmers named Keegan, Egan, Coffey and Heaney reveal that they only occur together within the Irish Midlands, see **Figure 5**. An examination of the surnames associated with County Longford and its borderlands reveals two groups of Keegans surrounded by some of the Gaelic Irish surnames that appear as close Y-DNA STR and SNP genetic matches, see **Figure 6**.

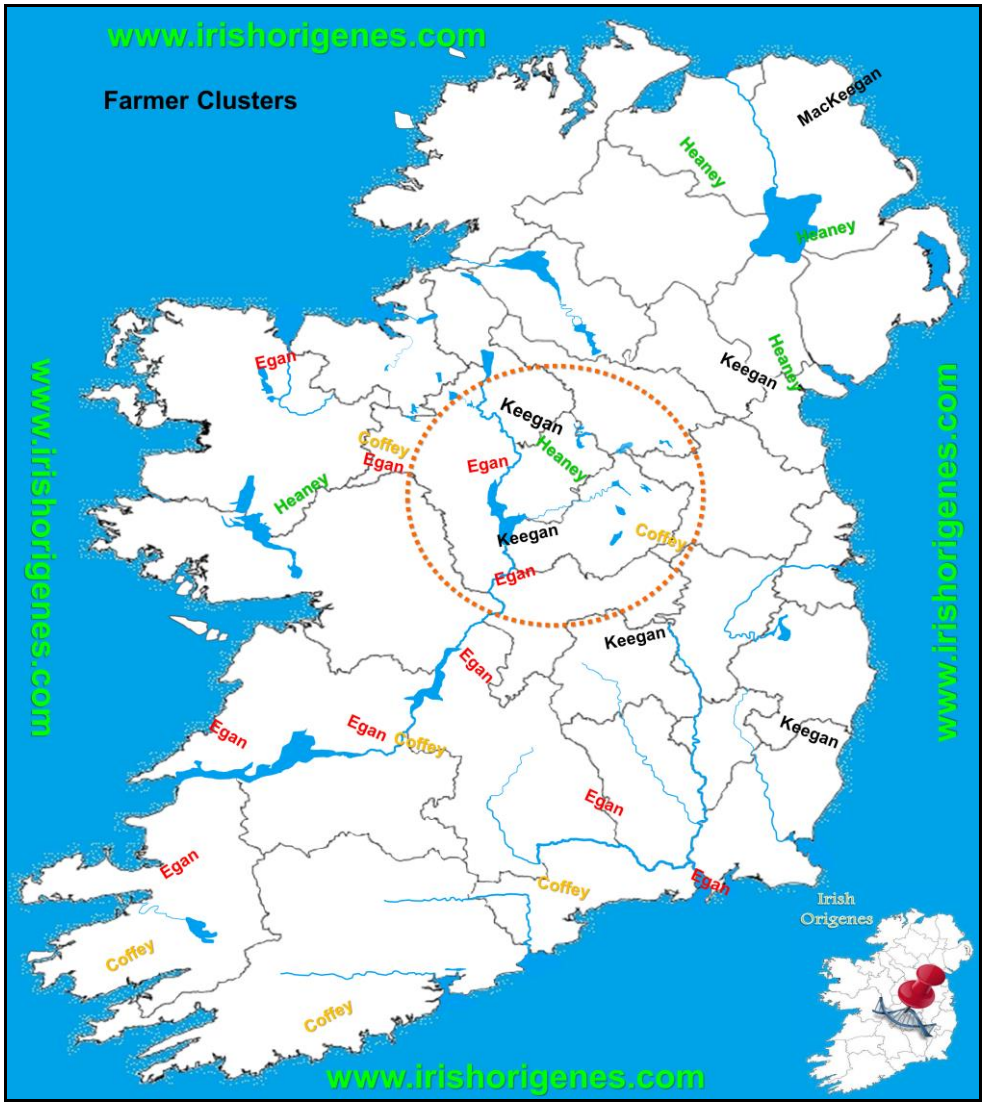

Figure 5: *Distribution mapping reveals a paternal ancestral link with the Irish Midlands. Y-DNA testing reveals that the Keegan, Egan, Coffey and Heaney surnames arose among a tribal group of related males. Distribution mapping of farmers named Keegan, Egan, Coffey and Heaney reveals that they crucially only occur together in the Irish Midlands (**orange broken circle**). Each surname is positioned in the location where farmers with that surname concentrated in early census data. The most common spelling is detailed in each location.*

Figure 6: *The Pre-Plantation surnames of County Longford and its borderlands. An examination of the surnames associated with County Longford (as it appears on the New 2nd edition of the Irish Origenes Surnames map) reveals the Keegan surname (**red arrows**) together with the Egans that appear as frequent recurring STR matches (**orange arrow**). Given their close proximity to one another, all three groups of Egans and Keegans may be genetically related and arose as anglicised forms of Gaelic Irish 'MacAodhagain.' In Longford one also finds the Heaney and Quinn surnames (**yellow arrows**) that appear as close singular BigY SNP genetic matches to the test subject. The test subject's Y-DNA results reveal that his founding 'MacAodhagain-Adam' originated within, or close to County Longford in the Irish Midlands. Each surname is positioned in the location where farmers (Catholic/male/heads of household) concentrated in early census data. The most common spelling is detailed in each location.*

The Clan Territories of the Irish Midlands

By the 14th and 15th Centuries Ireland was a patchwork of territories which were dominated by over 400 of the most notable Irish clans and Norman families. The Irish Origenes Clan Territories of Ireland Map was reconstructed based on the location of castles and towerhouses and their known historical link to a particular clan or family. Research at Irish Origenes has discovered that modern commercial ancestral Y-DNA testing will often reveal one's shared paternal ancestry with one or more of the prominent clans or families that once ruled over one's paternal ancestral genetic homeland. An examination of County Longford and its borderlands as it appears on the clan map reveals that the test subject's *MacAodhagain* ancestors lived in an area dominated by Gaelic Irish clans, see **Figure 7**. The Clan map also reveals that the Quinns (Guinn) and Fallons (Fullens) that appear as close Big Y SNP genetic matches once controlled areas in the Irish Midlands, see **Figures 2** and **7**.

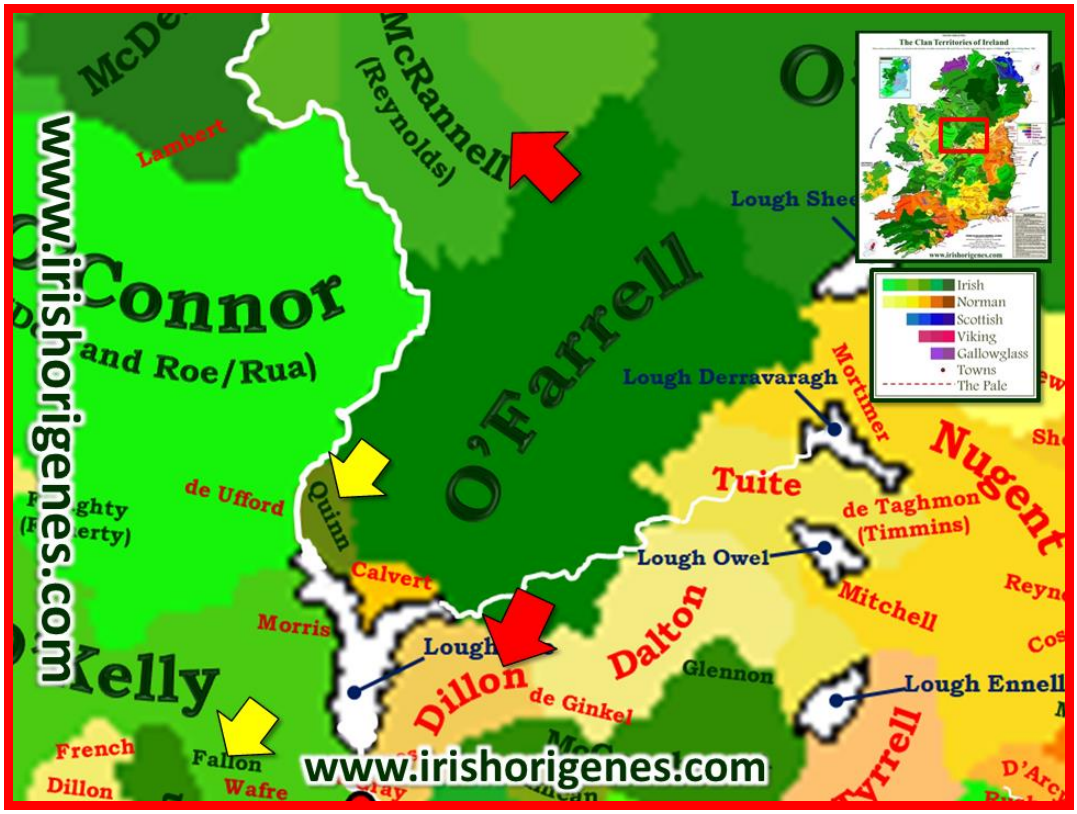

Figure 7: *The Clan territories of Longford and its borderlands. The clan map reveals that the Keegans of the Irish Midlands (**red arrows**) lived in an area dominated by Gaelic Irish clans whose lands bordered those of prominent Norman families. An examination of the surrounding area reveals the Gaelic Quinn and Fallon clans (**yellow arrows**) that appear as close BigY block display matches to the test subject (as 'Guinn' and 'Fullan'). The clan map was reconstructed based on castle locations and their historically associated clan or family.*

Mr Keegan's Most Recent Irish Paternal Ancestral Genetic Homeland

The test subject's Y-DNA test results reveal that the Egan and Ke*egan* surnames arose in the Irish Midlands as anglicised variants of the Gaelic '*MacAodhagain.*' When one's ancestors have lived in an area for a long time, one will often find evidence of their links in the surrounding monuments and placenames. Strikingly, an examination of County Longford and its borderlands reveal 4 townlands that are associated with the '*MacAodhagain*' surname, see **Figure 8** and **9**. Townlands are Ireland's smallest geographical unit of land division, with the entire island divided into approximately 64,000 townlands, many of which predate the Norman invasion (1169AD) and are named after the clans that lived there. In this manner the townlands of 'Ballymakeegan' (MacAodhagain town), 'Lismakeegan' (MacAodhagain fort), 'Carrickmakeegan' (MacAodhagain rock) and 'Derrymacegan' (MacAodhagain forest) marked the boundaries of the test subject's MacAodhagain ancestors territory; and it is in the borderlands of modern Longford and Leitrim that the test subject's most recent paternal ancestral genetic homeland is to be found, see **Figure 8**. It was there that the test subject's direct male ancestor settled together with genetic relatives sometime prior to the appearance of surnames in Ireland (circa 1000AD). It was there that his ancestor (his paternal-Adam) first took the MacAodhagain surname, surrounded by genetic relatives who took other surnames like Coffey, Quinn and Heaney. The test subject's paternal ancestors will

undoubtedly have left evidence of their ancestral links with this area in its history and in the DNA of the current inhabitants.

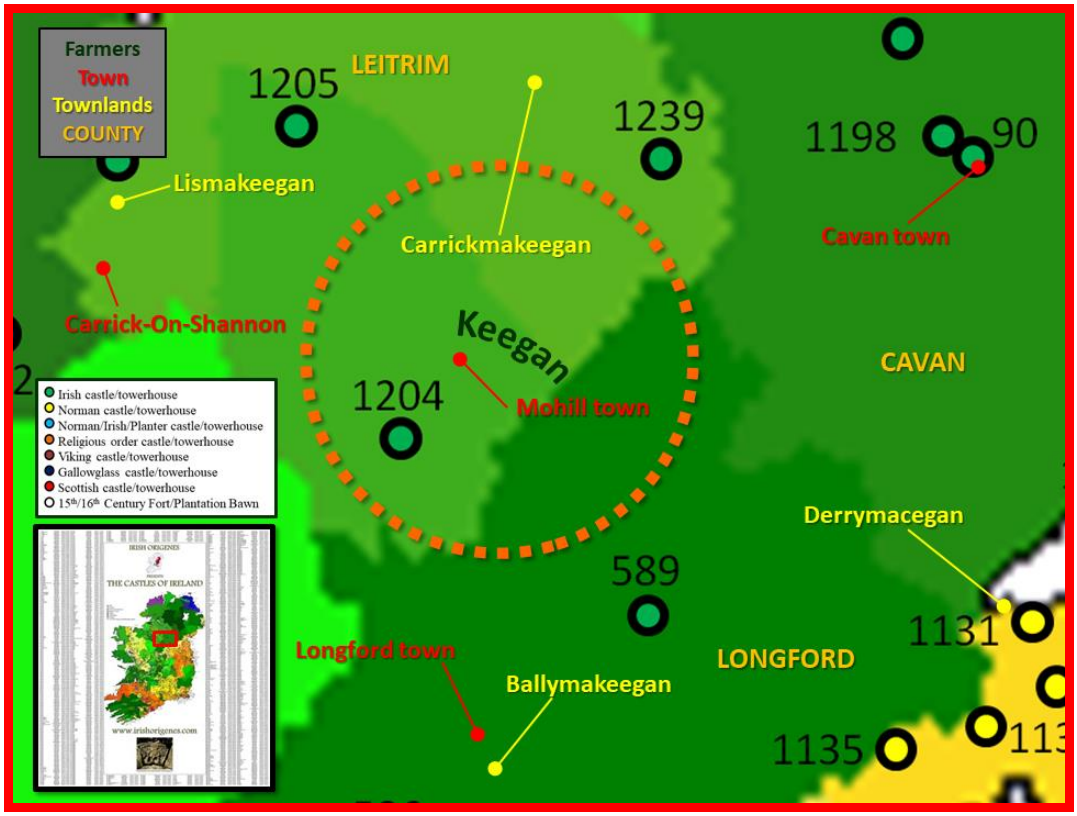

Figure 8: *Mr Keegan's most recent Irish Paternal Ancestral Genetic Homeland. An examination of the Irish Midlands reveals a wealth of 'MacAodhagain' townlands that surround the Keegan farming community that concentrates on the Leitrim and Longford borderlands; and it is there that the test subject's most recent Irish paternal ancestral genetic homeland (**orange broken circle**) is to be found. It was there that his Gaelic Irish ancestor settled at some point prior to the appearance of surnames in Ireland (1000AD). It was also there that his MacAodhagain-Adam lived surrounded by genetic relatives who acquired other surnames like Coffey, Heaney and Quinn. His Keegan ancestors will have left evidence of their ancestral links in its history and in the DNA of its current inhabitants.*

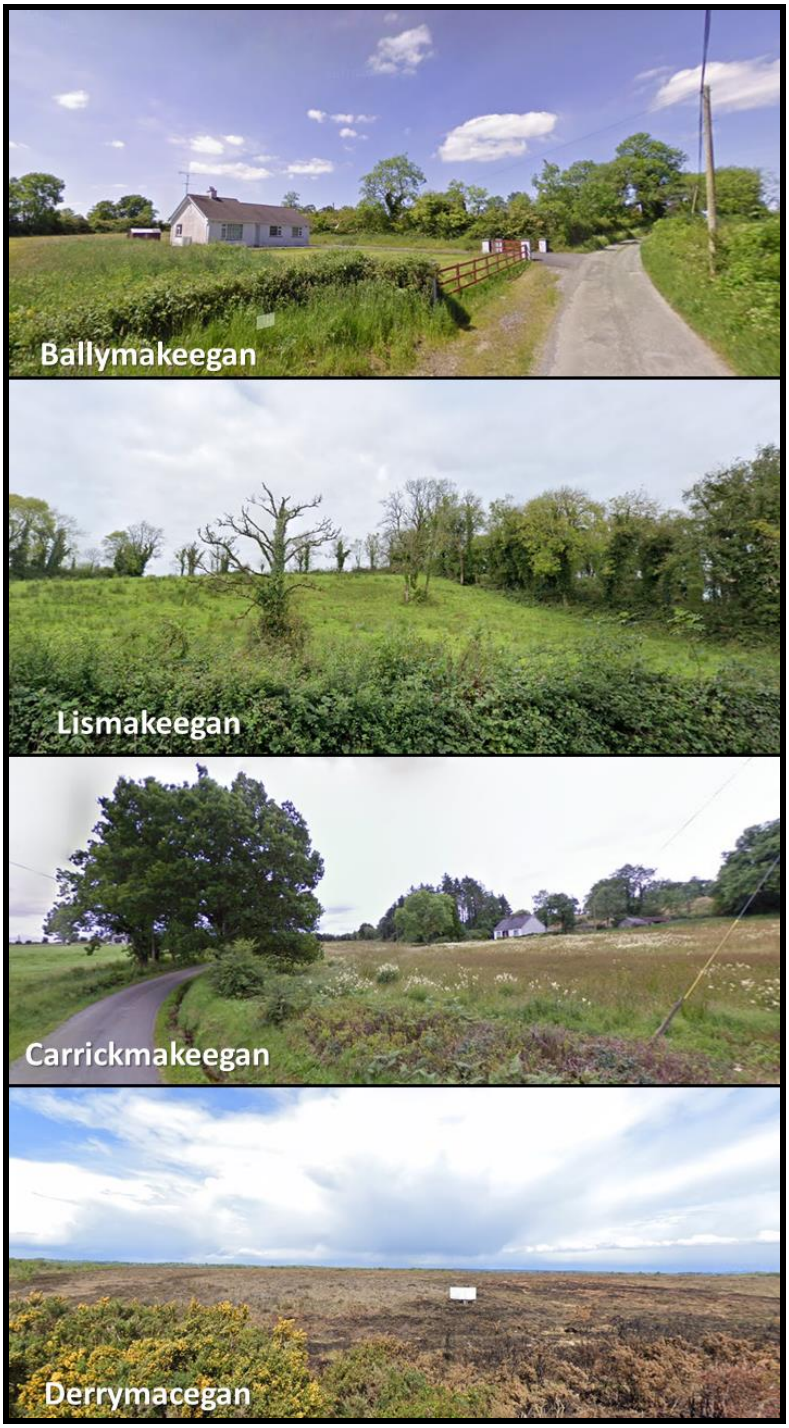

Figure 9: *MacAodhagain townlands that surround the 'Keegan' farming community on the Leitrim and Longford borderlands.*

The Expansion of R-M222^{+ve} Inishowen Males throughout Ireland and Scotland

'Vikings,' 'Foreign Helpers' and 'Raiders from across the Sea'

The test subject carries the ancient Irish R-M222 Y-DNA genetic marker which appeared in a single male who lived on Inishowen in the far northwest of Ireland approximately 1,800 years ago. This marker reveals that Mr Keegan's earliest Irish paternal ancestors lived on the Inishowen peninsula in the far northwest of Ireland for many hundreds of years prior to the appearance of surnames. Commercial

ancestral Y-DNA testing, and extensive Y-DNA Case Studies at Irish Origenes have revealed areas beyond Inishowen shores where R-M222^{+ve} males predominate in the local population, particularly along Irelands west coast (Moy River valley and Galway Bay), Western Ulster, parts of the Irish Midlands and Southwest Scotland (Galloway and parts of Argyllshire). Clues as to why these R-M222^{+ve} Gaels began colonising throughout Ireland and Scotland can be found in their origin; Donegal (*Dún na nGall* '**base or fort of the Foreigner**') and their descriptive surnames which they took with them like Gallagher (*Ó Gallchobhair* meaning '**Foreign helper**') who upon settling along the west coast of Ireland acquired new surnames like Higgins (*O'hUigin* meaning '**Viking**') and Halloran (*O'hAllmhurain* meaning '**Pirate** or **Stranger from overseas**'). Modern DNA science indicates that during Irelands Viking Age (800AD - 1169AD), that the R-M222^{+ve} Gaels of Inishowen had formed an alliance with Scandinavian 'Vikings' and that Christian-Gael and Heathen-Gall (*Gall = foreigner*) had together raided and colonised throughout Ireland and beyond, see **Figure 10**. In support of this Viking-Inishowen connection, research at Irish Origenes has uncovered at least three individuals with recent Inishowen ancestry but with Scandinavian paternal Y-DNA; clear evidence of Scandinavian contact with Inishowen. The Inishowen Gaels that colonised parts of Ireland and Scotland took their genetic marker (R-M222) with them, and would acquire surnames (like MacAodhagain) in the areas they settled permanently.

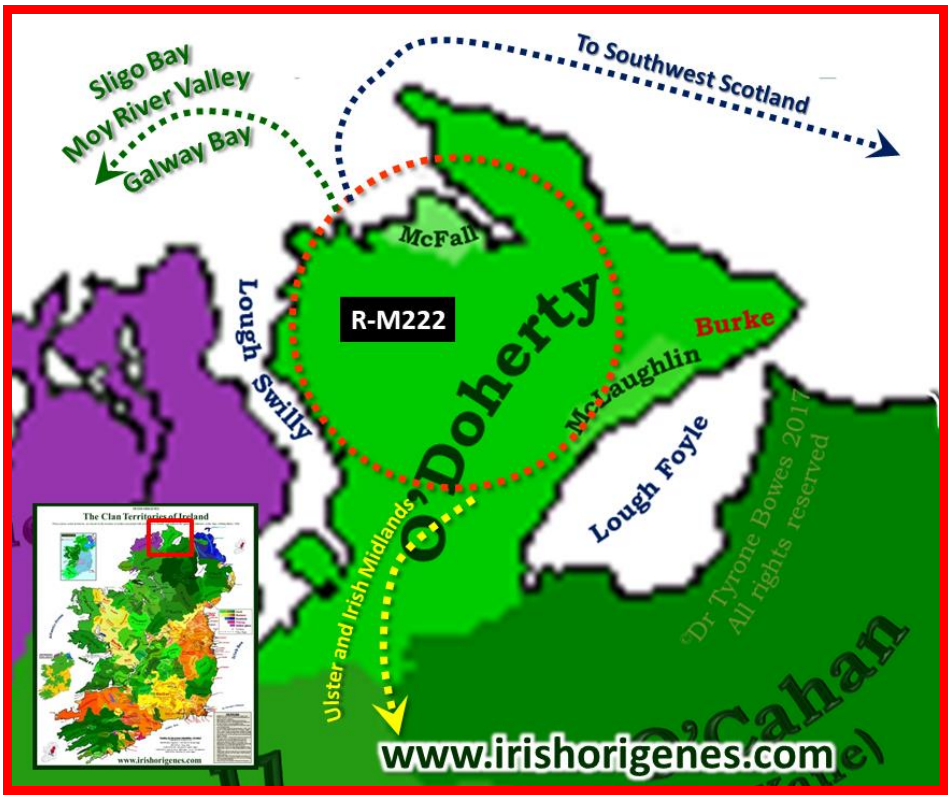

Figure 10: *An earlier paternal link with Inishowen. The Dohertys that dominated Inishowen in Northwest Ireland also dominate the genetic matches of individuals that carry the R-M222 genetic marker. The test subject's paternal ancestor departed Inishowen to settle in the Irish Midlands at some point prior to the appearance of surnames in Ireland. Conquest and settlement throughout Ireland and Scotland would result in an explosion of new surnames among the descendants of R-M222 Inishowen Gaels.*

How to confirm a pinpointed 'Paternal Ancestral Genetic Homeland'

One must keep in mind that this is a scientific approach to identifying a paternal ancestral origin, and that the connection to an identified area can be confirmed by Y-DNA testing males with a particular surname from the identified area. Confirmation of the paternal ancestral link with the Keegans of the Leitrim and Longford borderlands will require the recruitment of farmers named Keegan from that area for commercial ancestral Y-DNA testing. An earlier connection with Inishowen will require the recruitment of Dohertys from Inishowen for commercial Y-DNA testing.

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