Contact Dr Tyrone Bowes for a FREE consultation on you DNA test results or to find out about a suitable DNA test
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Morrison
An Autosomal (Ancestry.com) DNA Case Study

www.scottishorigenes.com

Dr Tyrone Bowes
12th August 2022

INTRODUCTION

There are several 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 the origin of the various branches in one's own ancestral tree. The challenge of modern autosomal DNA analysis is linking a common location revealed in the autosomal DNA test result with a particular ancestral surname.

INTERPRETING THE AUTOSOMAL RESULTS

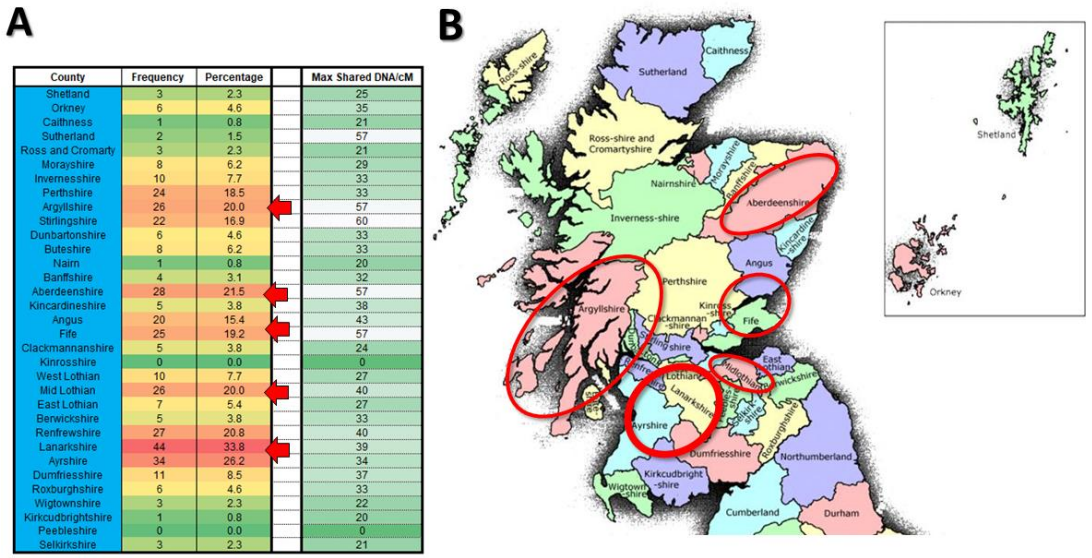
An examination of Mr. Morrison's 'autosomal' DNA test results revealed 38,194 genetic relatives, the vast majority of whom record ancestral information, see **Figure 1**. The locations recorded by the test subject's autosomal genetic relatives are ***NOT RANDOM***, the countries of Scotland and Ireland feature prominently in frequency and shared DNA, see **Figure 1**.

Autosomal DNA stats			
Genetic Relatives	**38,194**	**Percentage**	**Max. Shared DNA/cM**
>20cM Generic relatives	851	2.2	1260
>20cM Ireland	180	21.2	245
>20cM Scotland	130	15.3	60
>20cM England	176	20.7	245
>20cM Wales	43	5.1	38
>20cM Germany	103	12.1	245

Figure 1: *Scotland and Ireland gave strong autosomal DNA signals. Autosomal DNA testing revealed 38,194 genetic relatives, 851 of whom shared more than 20cM of DNA. The locations recorded by those genetic relatives are NOT RANDOM, given their respective populations sizes, Ireland and Scotland feature prominently in frequency and shared DNA.*

The Ancestral links with Scotland and Ireland

The locations recorded within Scotland and Ireland by the test subject's autosomal genetic relatives are not random, and a blast search of that ancestral detail for the 1841 counties of Scotland revealed 5 DNA hotspots centred upon Lanarkshire, Mid-Lothian, Aberdeenshire, Fife, and Argyllshire, see **Figure 2**. An examination of the Irish counties recorded by the test subject's autosomal genetic relatives revealed 5 DNA hotspots centred upon Down and Donegal in Ulster, Dublin and Laois in Leinster, and Cork in Munster, see **Figure 3**. The dominance of Ulster counties which were heavily colonised by Scots and English in the early 17th Century indicates that most of the test subjects 'Irish DNA' is the result of more recent Plantation settlement. The signal from Dublin may be non-specific noise, the result of more recent migration to city.

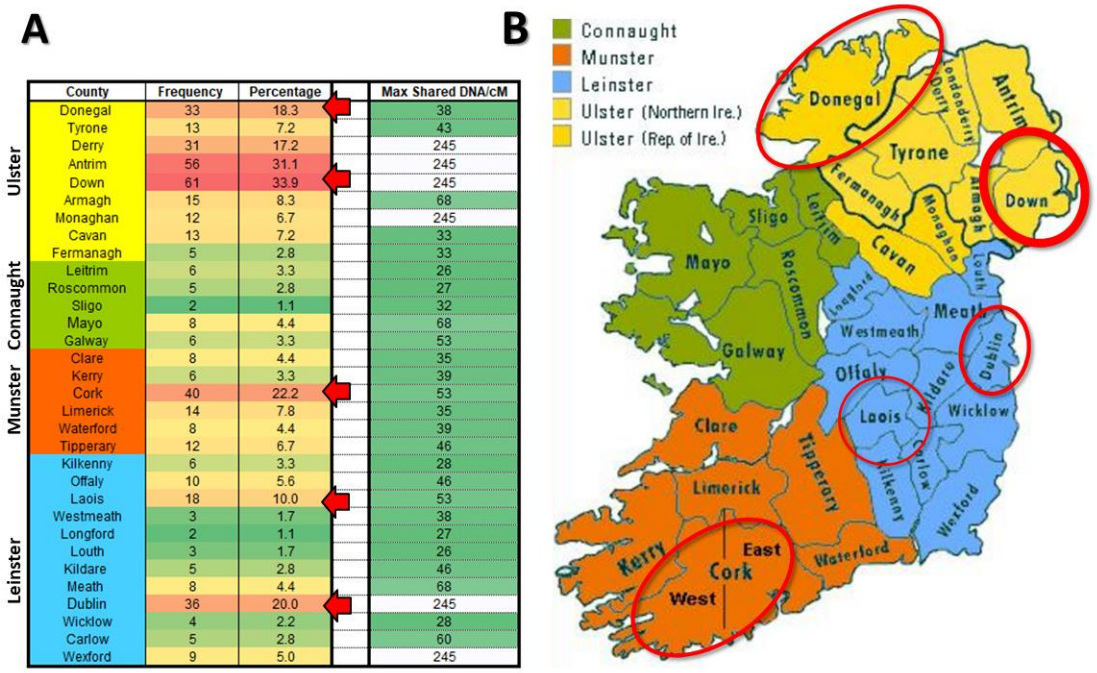


A

County	Frequency	Percentage		Max Shared DNA/cM
Shetland	3	2.3		25
Orkney	6	4.6		35
Caithness	1	0.8		21
Sutherland	2	1.5		57
Ross and Cromarty	3	2.3		21
Morayshire	8	6.2		29
Invernesshire	10	7.7		33
Perthshire	24	18.5		33
Argyllshire	26	20.0		57
Stirlingshire	22	16.9		60
Dunbartonshire	6	4.6		33
Buteshire	8	6.2		33
Nairn	1	0.8		20
Banffshire	4	3.1		32
Aberdeenshire	28	21.5		57
Kincardineshire	5	3.8		38
Angus	20	15.4		43
Fife	25	19.2		57
Clackmannanshire	5	3.8		24
Kinrosshire	0	0.0		0
West Lothian	10	7.7		27
Mid Lothian	26	20.0		40
East Lothian	7	5.4		27
Berwickshire	5	3.8		33
Renfrewshire	27	20.8		40
Lanarkshire	44	33.8		39
Ayrshire	34	26.2		34
Dumfriesshire	11	8.5		37
Roxburghshire	6	4.6		33
Wigtownshire	3	2.3		22
Kirkcudbrightshire	1	0.8		20
Peebleshire	0	0.0		0
Selkirkshire	3	2.3		21

B

Figure 2: *Autosomal testing reveals 5 DNA hotspots within Scotland. An examination of the 1841 counties of Scotland detailed by the test subject's autosomal genetic relatives that shared greater than 20cM of DNA reveals autosomal DNA hotspots centred on Lanarkshire, Mid-Lothian, Aberdeenshire, Fife, and Argyllshire (**red arrows**, **panel A**, **red circles**, **panel B**). Much of the signal from Lanarkshire and Mid-Lothian may be non-specific noise, the result of more recent migration to the cities of Glasgow and Edinburgh, respectively.*



A

	County	Frequency	Percentage		Max Shared DNA/cM
Ulster	Donegal	33	18.3		38
	Tyrone	13	7.2		43
	Derry	31	17.2		245
	Antrim	56	31.1		245
	Down	61	33.9		245
	Armagh	15	8.3		68
	Monaghan	12	6.7		245
	Cavan	13	7.2		33
	Fermanagh	5	2.8		33
Connaught	Leitrim	6	3.3		26
	Roscommon	5	2.8		27
	Sligo	2	1.1		32
	Mayo	8	4.4		68
	Galway	6	3.3		53
Munster	Clare	8	4.4		35
	Kerry	6	3.3		39
	Cork	40	22.2		53
	Limerick	14	7.8		35
	Waterford	8	4.4		39
	Tipperary	12	6.7		46
Leinster	Kilkenny	6	3.3		28
	Offaly	10	5.6		46
	Laois	18	10.0		53
	Westmeath	3	1.7		38
	Longford	2	1.1		27
	Louth	3	1.7		26
	Kildare	5	2.8		46
	Meath	8	4.4		68
	Dublin	36	20.0		245
	Wicklow	4	2.2		28
	Carlow	5	2.8		60
	Wexford	9	5.0		245

B

Figure 3: *Autosomal testing reveals 5 DNA hotspots within Ireland. An examination of the Irish counties detailed by the test subject's autosomal genetic relatives that share greater than 20cM of DNA reveals 5 autosomal DNA hotspots centred on Down and Donegal in Ulster, Dublin and Laois in Leinster, and Cork in Munster (**red arrows**, **panel A**, **red circles**, **panel B**). The signal from Dublin may be non-specific noise, the result of more recent migration to the city.*

Ancestral Surnames

Mr. Morrison's most recent ancestral papertrail reveals a mix of surnames of Scottish and English origin, see **Figure 4**. Since surnames arose in an agricultural based society, farmers with each surname can still be found concentrated in early census data in the area where their surname first appeared or in the area where one's ancestors first settled. An examination of the distribution of Scottish farmers named Harkness, Lindsay, Morrison, Robb, Scott, and Smyth revealed that they are associated with multiple locations spread throughout Scotland, some of which are also associated with autosomal DNA hotspots, see **Figure 5**.

In Ireland, the descendants of Gaelic Irish, Normans, and Scottish mercenary Gallowglass were overwhelmingly Catholic in early census data, while those descended from 17th Century Plantation Scots and English were overwhelmingly Protestant. Irish census data reveals that the Abraham, Harkness, Lindsay, Morrison, Robb, Scott, Smyth, and Woods surnames are associated with 17th Century Plantation settlement, and distribution mapping reveals distinct groups spread throughout Ulster in the north of Ireland, some of which are also associated with autosomal DNA hotspots, see **Figure 6**.

Ancestral Surname
Morrison
Robb
Abraham
Harkness
Woods
Lindsay
Smyth
Scott

Figure 4: *Ancestral surnames and common spelling variants. Highlighted font indicates each surnames associated ethnicity: Scottish/Scotland, English/England, Multiple-associated ethnicities.*

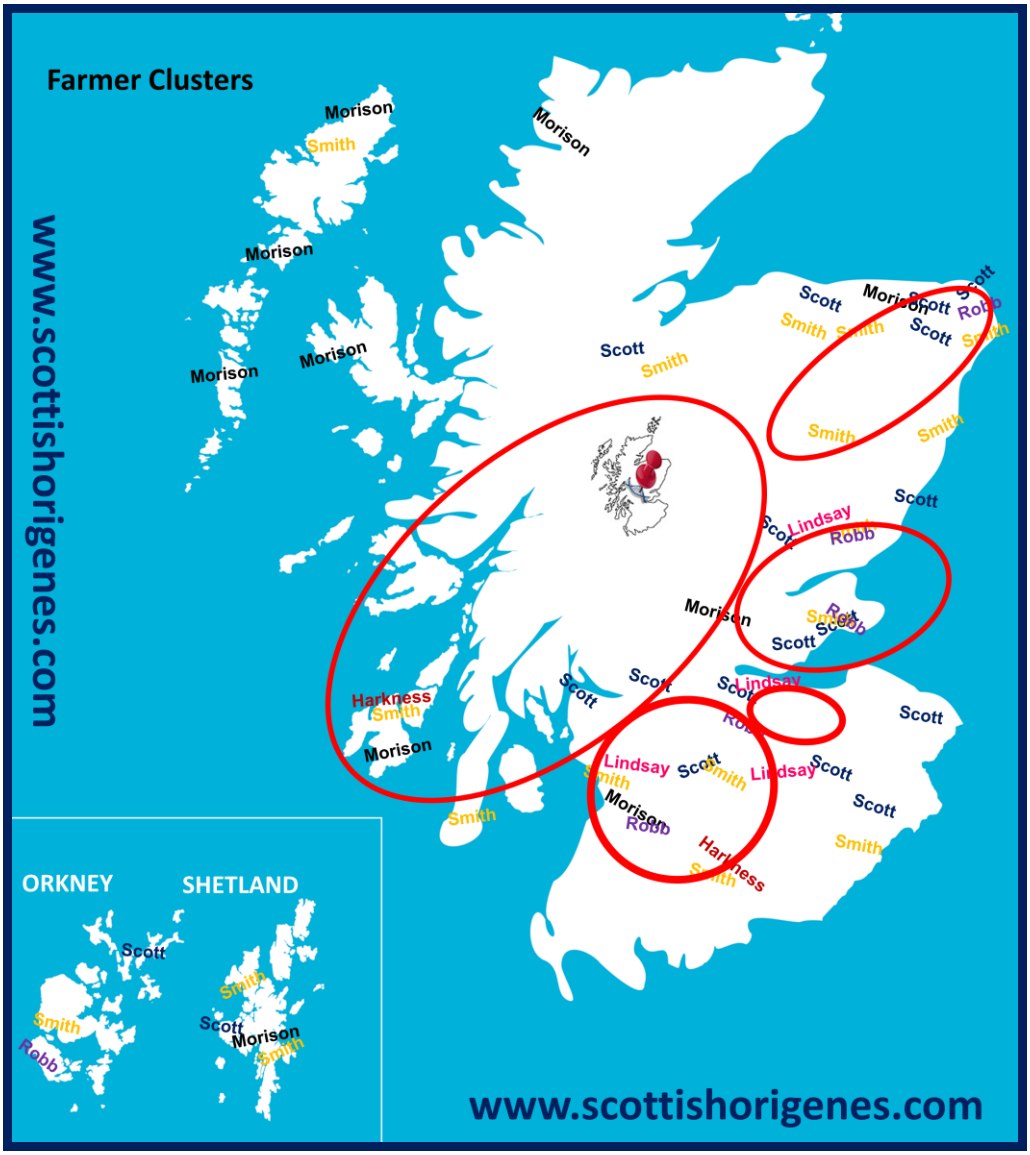


Figure 5: *Scottish farming communities and autosomal DNA revealed hotspots. Farmers with each Scottish surname still concentrated in early census data in the area where their surname first appeared. Distribution mapping reveals that farmers named Harkness, Lindsay, Morrison, Robb, Scott, and Smyth concentrated in distinct locations, some of which are located among the test subject's autosomal DNA hotspots (**red circles**). Each surname is placed in the location where farmers with each surname concentrated in early census data. The most common spelling is detailed in each location. Each surname is positioned as it appears on the Scottish Origenes Surnames of Scotland map, free to view: **https://www.origenesmaps.com/***

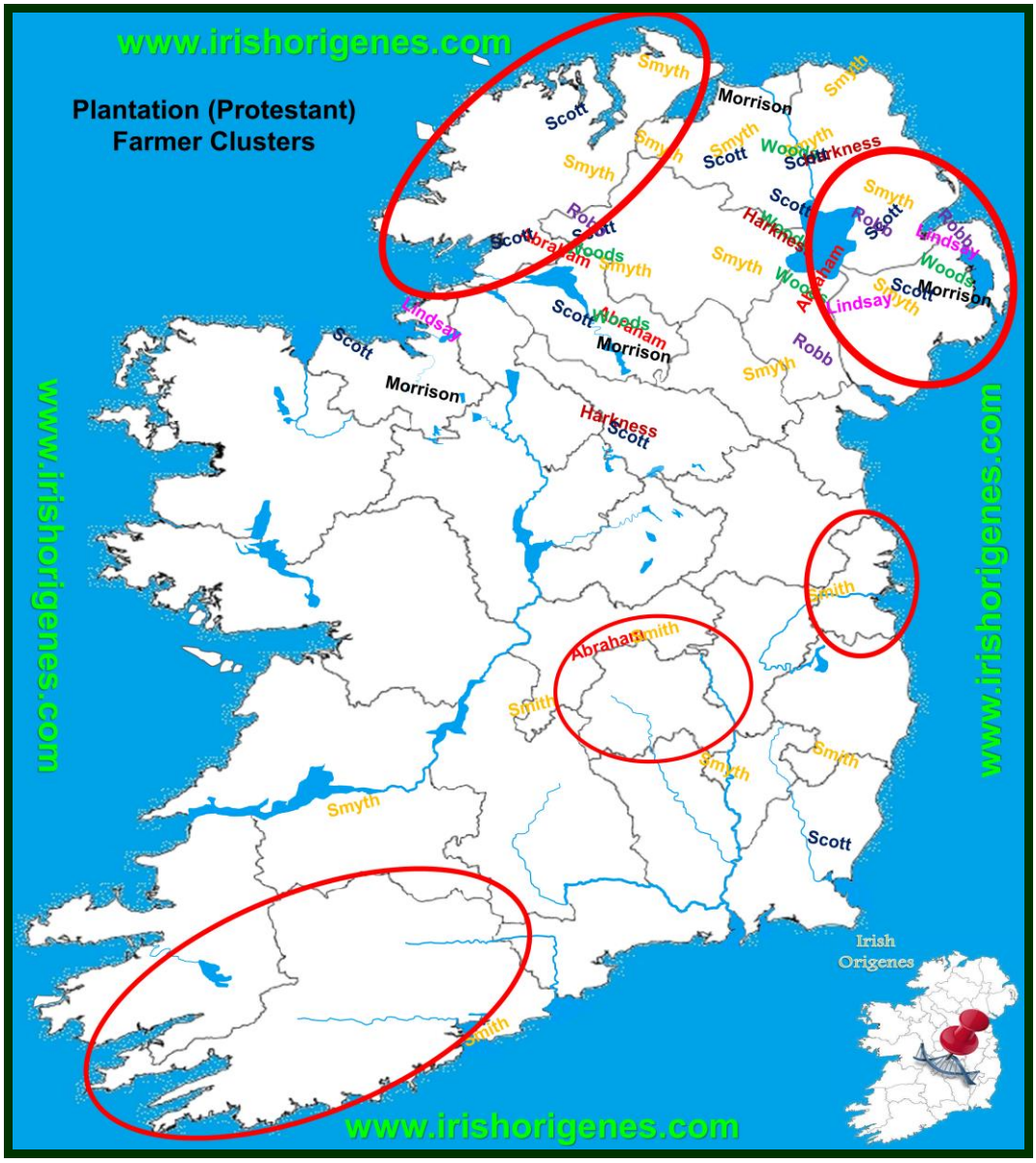


Figure 6: *Irish Plantation farming communities and autosomal DNA revealed locations. Census data reveals that individuals with Gaelic Irish, Norman, or Scottish Gallowglass surnames were overwhelmingly Catholic, while those with 16th and 17th Century Plantation Scottish or English surnames were overwhelmingly Protestant. The Abraham, Harkness, Lindsay, Morrison, Robb, Scott, Smyth, and Woods surnames are associated with Plantation settlement within Ireland. Distribution mapping of farmers (Protestant, male, heads of household) named Abraham, Harkness, Lindsay, Morrison, Robb, Scott, Smyth, and Woods in early census data reveals multiple distinct groups concentrated in Ulster, some of which are associated with autosomal DNA revealed locations (**red circles**). Each surname is positioned as it appears on an Irish Origenes Plantation Surnames maps, free to view: **https://www.origenesmaps.com***

LINKING ANCESTRAL SURNAMES WITH AUTOSOMAL DNA HOTSPOTS

The ancestral information (surnames and locations) recorded by one's autosomal DNA genetic relatives are not random, reflecting the relationships that developed among one's most recent ancestral lines in specific locations. One can therefore blast search that detail for locations associated with the test subject's ancestral surnames. One can then compare the distribution of one's ancestral surnames with

DNA revealed locations, together with autosomal search results to begin the process of linking each ancestral surname with its Scottish and/or Irish origin.

The non-random nature of the ancestral locations recorded by the test subject's autosomal genetic relatives can be easily demonstrated by examining the countries of Britain, Ireland, and Germany that are recorded in association with the test subject's ancestral surnames, see **Figure 7**. Autosomal search results reveal Scottish origins for the test subject's Lindsay, Morrison, Robb, Scott, and Smyth ancestral lines, see **Figure 7**. Autosomal searching also revealed more recent Plantation Irish links for his Abraham, Harkness, Lindsay, Morrison, Robb, Scott, Smyth, and Woods ancestors, see **Figure 7**. Blast searching among the ancestral information recorded by the test subject's autosomal genetic relatives for Scottish ancestral surnames in association with each 1841 Scottish county reveals DNA hotspots/origins for the Harkness (Dumfriesshire) Lindsay (Lanarkshire), and Scott (Lanarkshire) ancestral lines, see **Figure 8**. In contrast, two locations emerged for the Morrisons, while the signal was too low to determine a Scottish origin for the Robbs, see **Figure 8**. Blast searching the ancestral information recorded by the test subject's autosomal genetic relatives for ancestral surnames in association with each Irish county reveals that County Down dominates, see **Figure 9**. In contrast, the English Abrahams surname revealed a Southern Irish origin within the borderlands of Counties Laois and Offaly, in an area settled by the English in the 16th Century.

The Plantation of Ireland was a highly organised affair, and research at Irish and Scottish Origenes has revealed that the Plantation surnames in each location often mirror those of their Scottish or English origin, indicating that whole communities had departed, travelled, and settled together within Ireland. In addition, Counties Antrim and Down in Northeast Ireland were often the first point of settlement for the Plantation Scots, and an examination of North Down as it appears on the Irish Origenes Plantation surnames of Ireland map reveals almost all the test subject's Scots Irish-associated surnames in the farmland that surrounds the town of Carryduff, see **Figures 10**. The Scottish Origenes Surnames of Scotland map details where each surname originated, and an examination of the borderlands of Ayrshire, Dumfriesshire and Lanarkshire which dominates as a Scottish DNA hotspot reveals all the test subject's Scottish ancestral surnames in the area surrounding the village of Sanquhar, see **Figure 11**. The test subject's ancestral surnames and their autosomal DNA revealed origins are summarised in **Figure 12**.

Autosomal Blast Search Results

Surname	Ireland		Scotland		England		Wales		Germany	
	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM
Morrison	4	39	2	27	2	24	0	0	0	0
Morrison (12cM)	20	39	23	27	7	24	0	0	1	13
Morison	1	24	2	60	0	0	0	0	0	0
Morison (12cM)	2	24	11	60	0	0	0	0	0	0
Robb	1	27	1	21	0	0	0	0	0	0
Robb (12cM)	5	27	7	21	0	0	0	0	0	0
Abraham (12cM)	4	46	0	0	1	12	0	0	1	14
Harkness (12cM)	4	20	6	20	1	20	0	0	2	18
Woods	7	34	0	0	2	23	0	0	1	23
Lindsay	2	32	3	28	1	22	0	0	0	0
Lindsay (12cM)	4	32	24	28	2	22	0	0	0	0
Smyth	1	37	1	24	0	0	0	0	0	0
Smyth (12cm)	13	37	5	24	6	18	0	0	0	0
Smith	7	40	10	27	10	40	0	0	2	26
Scott	0	0	4	27	3	37	0	0	0	0
Scott (12cm)	18	16	68	27	44	37	1	13	0	0

Figure 7: *Autosomal blast search results for ancestral surnames within Britain, Ireland, and Germany. The ancestral locations revealed by one's autosomal genetic relatives are not random, reflecting the relationships that developed among the test subject's various ancestral lines living in specific areas. Autosomal blast searching of genetic relatives that share greater than 20 or 12cM of DNA for the countries of Ireland, Scotland, England, Wales, and Germany graded according to maximum shared DNA (cM) reveals Scottish (**blue arrows**) origins for his Harkness, Lindsay, Morrison, Robb, Scott, and Smyth ancestors, together with more recent Plantation Irish links (**green arrows**) for the Abraham, Harkness, Lindsay, Morrison, Robb, Scott, Smyth, and Woods ancestral lines.*

Autosomal Blast Search Results

County	Harkness		Lindsay		Scott		Robb		Morrison	
	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM
Shetland	0	0	0	0	0	0	0	0	0	0
Orkney	0	0	0	0	1	14	0	0	0	0
Caithness	0	0	0	0	0	0	0	0	0	0
Sutherland	0	0	0	0	0	0	0	0	1	14
Ross and Cromarty	0	0	0	0	0	0	0	0	1	12
Invernesshire	0	0	0	0	0	0	0	0	0	0
Perthshire	0	0	1	23	2	15	0	0	1	14
Nairn	0	0	0	0	0	0	0	0	0	0
Morayshire	0	0	0	0	1	12	0	0	0	0
Banffshire	0	0	0	0	1	20	1	16	3	18
Aberdeenshire	0	0	1	21	4	20	2	21	1	13
Kincardineshire	0	0	0	0	0	0	0	0	0	0
Angus	0	0	3	23	1	18	1	17	1	18
Fife	0	0	6	28	8	27	0	0	1	18
West Lothian	0	0	1	12	0	0	0	0	0	0
Clackmannanshire	0	0	0	0	0	0	0	0	0	0
Kinrosshire	0	0	0	0	0	0	0	0	0	0
Mid Lothian	0	0	0	0	12	19	0	0	1	12
East Lothian	0	0	1	13	5	27	0	0	0	0
Berwickshire	0	0	0	0	1	15	0	0	0	0
Kirkcudbrightshire	0	0	0	0	0	0	0	0	0	0
Peebleshire	0	0	0	0	1	13	0	0	0	0
Selkirkshire	0	0	0	0	3	18	0	0	0	0
Dunbartonshire	0	0	2	17	0	0	0	0	0	0
Argyllshire	0	0	0	0	0	0	0	0	5	27
Stirlingshire	0	0	0	0	0	0	0	0	4	14
Buteshire	0	0	0	0	0	0	0	0	0	0
Renfrewshire	0	0	0	0	5	22	0	0	0	0
Wigtownshire	0	0	0	0	0	0	0	0	3	14
Ayrshire	0	0	2	16	2	16	1	19	3	12
Lanarkshire	1	12	7	18	14	18	1	12	0	0
Dumfriesshire	3	20	0	0	5	20	0	0	0	0
Roxburghshire	0	0	1	13	5	20	0	0	0	0

Figure 8: *Autosomal blast search results for Scottish Harkness, Lindsay, Morrison, Robb, and Scott in association with the 1841 counties of Scotland. The Scottish counties recorded by the test subject's autosomal genetic relatives (that share greater than 12cM of DNA) in association with ancestral surnames are not random and reveal DNA hotspots/origins for (**blue arrows**) his Harkness, Lindsay, Morrison and Scott ancestral lines. In contrast no clear location emerged or his Robbs and the signal was too low to explore his Scottish Smyth origin.*

Autosomal Blast Search Results

County	Morrison		Robb		Lindsay		Smyth		Scott		Woods		Abraham		Harkness	
	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM	Frequency	Max. DNA/cM
Roscommon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sligo	0	0	0	0	1	34	0	0	0	0	0	0	0	0	0	0
Mayo	0	0	0	0	1	12	1	19	0	0	0	0	0	0	0	0
Galway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clare	0	0	0	0	0	0	0	0	0	0	1	21	0	0	0	0
Kerry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cork	**0**	**0**	**1**	**17**	**0**	**0**	**0**	**0**	**1**	**15**	**0**	**0**	**0**	**0**	**1**	**20**
Limerick	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waterford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tipperary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	20
Kilkenny	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offaly	0	0	0	0	0	0	0	0	2	13	0	0	1	46	0	0
Laois	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**46**	**0**	**0**
Kildare	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dublin	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**20**	**0**	**0**	**0**	**0**
Wicklow	0	0	0	0	0	0	0	0	0	0	1	12	0	0	0	0
Carlow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wexford	0	0	0	0	0	0	1	20	0	0	0	0	0	0	0	0
Longford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Louth	0	0	0	0	0	0	1	12	0	0	1	16	0	0	0	0
Westmeath	0	0	0	0	0	0	1	12	0	0	0	0	0	0	0	0
Meath	0	0	0	0	0	0	1	12	0	0	12	25	0	0	0	0
Leitrim	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cavan	2	24	0	0	1	28	1	19	0	0	0	0	0	0	0	0
Monaghan	0	0	0	0	0	0	0	0	1	16	1	12	0	0	0	0
Fermanagh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Donegal	**1**	**15**	**0**	**0**	**1**	**12**	**3**	**20**	**3**	**13**	**0**	**0**	**0**	**0**	**0**	**0**
Tyrone	1	13	0	0	0	0	1	16	1	19	0	0	0	0	0	0
Derry	1	18	0	0	0	0	1	19	0	0	2	16	0	0	1	20
Antrim	5	15	1	20	0	0	4	15	4	24	4	16	0	0	0	0
Down	**4**	**245**	**2**	**245**	**3**	**14**	**6**	**60**	**2**	**44**	**8**	**34**	**0**	**0**	**0**	**0**
Armagh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 9: *Autosomal blast search results reveal a strong ancestral link with County Down in Ulster. The counties recorded by autosomal genetic relatives (that share greater than 12cM of DNA) for each Irish-associated ancestral surname are not random and reveal that almost all the Scots Irish associated surnames (Lindsay, Morrison, Robb, Scott, Smyth, Woods) are associated with County Down which dominated among autosomal DNA revealed locations (**green arrows**). In contrast, English Abrahams is associated with the DNA hotspot of Laois (**red arrow**). The Woods surname also revealed links with County Meath which could be an indication that a migration has occurred (**yellow arrow**). No clear Irish origin emerged for the Harkness surname.*

Figure 10: *An ancestral link with the Plantation community of Northeast County Down. Irish farmers with each surname still concentrated in early census data in the area where their surname first appeared or in the area where one's ancestors first settled, and an examination of the Plantation community of North Down and bordering Antrim reveals many of the test subject's Scots Irish-associated surnames (**black arrows**) in the area surrounding the town of Carryduff. Each surname is positioned in the location where farmers with each surname concentrate in early census data. The most common spelling is detailed in each location. Each surname is positioned as it appears on the Irish Origenes Plantation Surnames map, free to view: **https://www.origenesmaps.com/***

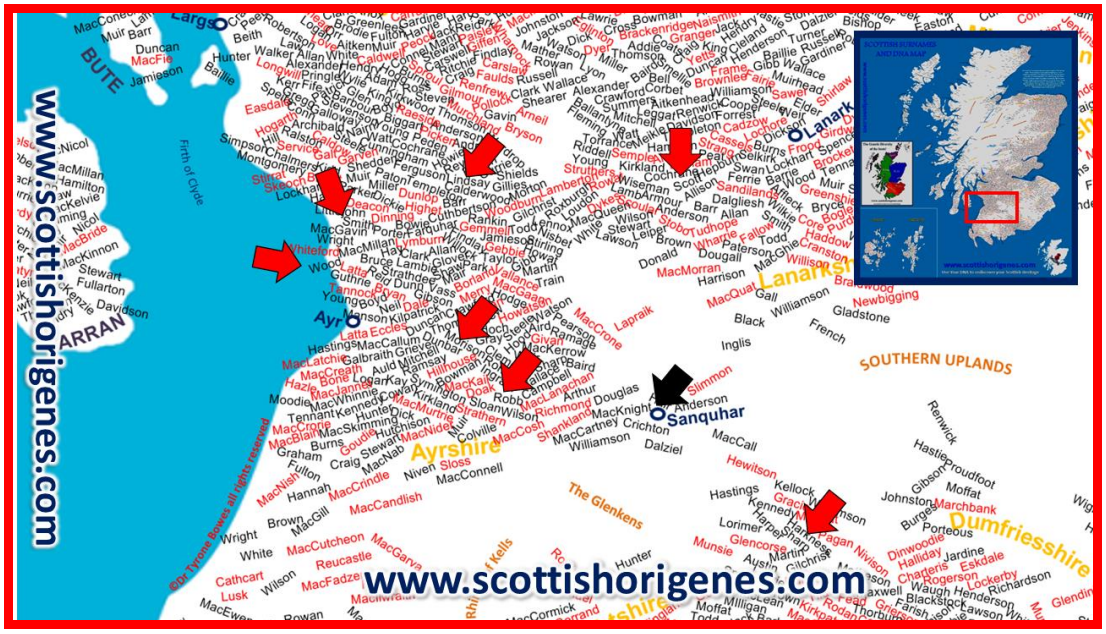


Figure 11: *The Surnames of the Ayrshire, Dumfriesshire, and Lanarkshire borderlands. Scottish farmers still concentrated in early census data in the area where their surname first appeared or in the area where one's ancestors first settled. An examination of the surnames that surround Sanquhar village (**black arrow**) reveals all the test subject's Scottish-associated ancestral surnames (**red arrows**). The surrounding area also reveals many surnames that are found among the Plantation Scots Irish farming community of North County Down. Each surname is positioned in the location where farmers with each surname concentrate in early census data. The most common spelling is detailed in each location. Each surname is positioned as it appears on the Scottish Origenes Surnames of Scotland map, free to view: **https://www.origenesmaps.com/***

Ancestral Surname	Autosomal DNA Predicted Origins	
Morrison	Saintfield, County Down	Tarbolton, Ayrshire
Robb	Bangor, County Down	Auchinleck, Ayrshire
Abraham	Clonaslee, County Laois	England
Harkness	-	Closeburn, Dumfriesshire
Woods	Ballygowan, County Down? / County Meath?	Ayrshire?
Lindsay	Dundonald, County Down	Galston, Ayrshire
Smyth	Anahilt, County Down	Ayrshire?
Scott	Anahilt, County Down	Kirkmuirhill, Lanarkshire

Figure 12: *Ancestral surnames and Autosomal DNA revealed origins. Highlighted font indicates each surnames associated ethnicity or location: Scottish/Scotland, Irish/Ireland, English/England, Multiple-associated ethnicities/locations.*

Confirming an ancestral link to an identified area

One must keep in mind that this is a scientific 'DNA' approach. The DNA does not lie, and commercial ancestral DNA testing of individuals (farmers) with the surnames of interest from the ancestral DNA hotspots would confirm the ancestral link to that location.

Contact Dr Tyrone Bowes for a FREE consultation on you DNA test results or to find out about a suitable DNA test

tyronebowes@gmail.com