BARLING DNA SURNAME PROJECT (November 2009)

What can be learnt from the BARLING DNA Surname Project?:

BARLING is a fairly rare surname with only a small number of currently unlinked "branches". Moreover, most of those "branches" have origins in England, and in particular in a very specific part of Kent.

A key question we have been trying to answer is which BARLING branches (see below) indeed share a common direct male-line ancestor. This can now be answered through a simple DNA test.

The DNA test also gives indications as to the earlier, i.e. prehistoric, geographical origins of direct male-line ancestors.

Living BARLINGs belong to these "branches" named after places associated with them (http://freepages.genealogy.rootsweb.com/~pnlowe/barling.htm):

Branch	Earliest ancestor: Location (date)	Major locations	Notes
Brookland & Egerton	Egerton, Kent (1556)	Kent; USA	Barlings were in Egerton by 1486
Romsey	Lyndhurst, Hampshire (1682)	Hampshire, Wiltshire, Dorset; Australia; USA	Barlings in Hampshire around 1600
Sheppey & Ulcombe	Ulcombe, Kent (1526)	Kent	Ulcombe is 3 miles from Egerton
Warehorne	Little Chart, Kent (1718)	Kent; Australia; USA	Little Chart is 3 miles from Egerton
Kingston	Kingston-on-Thames, Surrey (1783)	Worcestershire; Gloucestershire; USA	Barlings in Kingston in 1725
Other branches	Maidstone & Headcorn, Kent (1650) Sweden (1667)	Kent; Hampshire;USA; Germany; Russia, Sweden	All English families from before 1750 are from Kent or Hampshire

What is the DNA test?

A kit, with full instructions, is sent by post to your address. A few cells are removed from the inside of the mouth, either through a vigorous mouthwash (SMGF) or a mild scraping of the inside of the cheek (FT DNA).The sample is placed in a tube and sent back to the laboratory in the USA by standard post. The test is painless, quick & simple.

Back in the laboratory standard procedures are used to extract the DNA, and then analyse the markers on the Y chromosome.

What are DNA markers? What results are obtained?

The Y chromosome is a portion of DNA which is passed in the male sperm from father to son, to the son's son, etc in a strict male line; Women do not have the Y Chromosome. Hence, the inheritance of the Y chromosome normally follows the inheritance of the BARLING surname. Exceptions would be when there is a "non-paternity" event, e.g. an adoption, surname change or the biological father is not the anticipated father.

The test analyzes many specific "markers" within the Y chromosome. Each "marker" is a small region of "non-coding" DNA. At every generation there is a small chance that a change (mutation) occurs in one of the markers of the Y chromosome. Very roughly once every 500 generations, a mutation occurs in one of the markers being tested. This has no effect on the individual as the markers in the "non-coding" regions have no obvious function. However, this low mutation rate allows one to follow the male line.

Each "marker" actually consists of a small section of DNA within which there are several repeats of the same DNA sequence. The mutations that occur change the number of these repeats. The DNA analysis measures the number of repeats of each marker. The end result is simply a list of the names of each marker and its measured number of repeats (the "marker value").

How does one interpret the DNA results & what information do they give? What is the effect of having more markers tested?

At each generation there is a chance of a change in "marker value" between father and son. Changes are random events, which occur independently at each marker. The most basic test involves analysis of 12 different markers. More sensitive tests use 25, 37 or 67 markers. At each marker, a mutation occurs only every 10000 years, or so. By increasing the number of markers tested, the chance of a mutation occurring anywhere in the set of markers increases. With 12 markers, there is roughly one change every 500 years. With 37 markers, there is likely to be a change every 160 years. Hence, by increasing the number of markers one can more precisely define the most likely date at which two living men's ancestry converge. This date is that of the MRCA (most recent common ancestor). It should be noted that all analysis is based on probabilities rather than certainty. The more data, the less doubt.

Family historians are interested in connections only within the last 1000years, and often only within the last 600 years. Identity of the values of 12 markers for two living BARLINGs would be consistent with an MRCA who might have been living anytime within the last 1000 years, or so. By using a higher number of markers, one can increase the precision of estimation of the dates at which the MRCA lived. The highest precision is obtained by including markers that mutate at higher frequency. Conversely a significant difference between the two 12 marker test results would suggest that it is highly unlikely that a MRCA existed within this period, and one would conclude that they are

effectively unrelated. In this case, using a higher number of markers, gives little or no further information.

Anthropologists and some family historians might also be interested in where ancestors came from over longer period. The 12 marker test gives an estimate of the Haplogroup. This is a pattern of marker values which is associated with specific ethnic populations, e.g. Western European, Norse etc, maybe over 10000years.

How does this genealogical test differ from other DNA tests? Can it be used to identify someone? Does it have any connection with disease?

This genealogical test is rather different from those used in forensic or paternity testing; in the latter, the principle aim is to establish a unique identification or identical match with another person. This is achieved by a more detailed test which involves obtaining the actual DNA sequence.

The genealogical test cannot be used to prove paternity or to identify someone (though theoretically it could be used to disprove paternity or to establish that two men are not identical); this is because many thousands of men will share the same pattern of markers as in the Y chromosome genealogical test being used. These men may not even be closely related. A very similar pattern of markers only becomes significant, when taken in conjunction with some other reason to think there is a relationship, for example if they share an unusual surname. As an example if one tested many SMITHs you would probably find two with the same genealogical DNA analysis, but they would not necessarily share a recent common ancestor. However, if two BARLINGs gave the same genealogical DNA analysis, it is highly probable that they share a recent common ancestor.

The genealogical test gives no information on disease susceptibility etc, and the test results are not affected by disease.

"Non-paternity" and other reasons for unanticipated results

There are several explanations for unanticipated results. Errors in the laboratory and during testing are rather unlikely. The most frequent reasons are "non-paternity" events, which are when the biological father is not the father expected from other sources, e.g. paper records or family knowledge. Most commonly this is due to adoptions, surname changes, illegitimacy (outside of marriage) or infidelity (within marriage). Of course errors in paper records or family knowledge (or their interpretation) can also be a problem.

A "non-paternity" event could occur in a very recent generation, or many hundreds of years back. For this reason, it is often required to obtain DNA from several descendants of the presumptive common BARLING ancestor; preferably these descendants are chosen to be as distantly related as possible. For example is the earliest ancestor had three sons, one would ideally identify & obtain a DNA sample from a living descendant of each.
IMPORTANT: You are not advised to participate if you would be upset by uncovering "non-paternity" events in your BARLING line. On the same lines, if you have

concerns about any of your male-line BARLING ancestors, it would be best to discuss with me before ordering a test.

Pros and cons of the Family Tree DNA and SMGF Tests and how to decide what to order. [NOTE SMGF TESTS NO LONGER AVAILABLE]

This description is a bit complex, and if unclear I would be happy to advise on an individual basis

For maximum information, most rapid results and simplicity one would order a 67-marker test. However, most people would not wish to spend that much money on the test (US$ 269). To allow maximum participation, we need to include the majority of people who would not wish to spend that much, or maybe even would wish the cost to be nothing. For this reason, there are alternatives with zero cost, and costs of $99 or $189. These alternatives will all provide very valuable information, but naturally have some limitations.

You have a choice of either (or indeed perhaps ideally both) using Family Tree DNA (FTDNA) at a cost or joining the Sorenson Molecular Genealogy Foundation Project (SMGF) at no cost (other than return postage).

The advantages of FamilyTree DNA are that it is an efficient & professional company that will provide quality assured results within a fairly short period (around 6 weeks), it is very simple to order & complete the requirements for the test kit and the test sample is stored so that further (perhaps more detailed) analysis can be requested in the future without resubmitting a sample. The only disadvantage is the cost. The basic 12 marker test costs 99 US dollars. The more detailed 37 marker test costs 189 US dollars.

The great advantage of SMGF is that there is no charge, and the high precision standard test (about 37 markers). The main disadvantage is that there is no guarantee when, or indeed if, data will be posted to their web database. Other disadvantages are that data is not directly sent to the participant (I can explain how data can be obtained from their web database) and for legal & confidentiality reasons there are more forms to complete.

With the SMGF test, there is no choice about the nature of the test and it gives a high precision 37 marker result. With FTDNA, one can select Y-DNA12, Y-DNA25, Y-DNA37 and Y-DNA67 tests at …… . The decision between them is a balance between information content and expense. If expense is no concern, then go for 67 markers. A good balance is the 37 marker test, whereas the minimum 12 marker test will provide the key information at the lowest cost. This can always be upgraded without a further sample at a later date. Currently, that cost is very similar to that if the fuller test was done straight way. [I would not suggest the intermediate 25 marker test].

This table summarizes the options; **note all except one are great for the Project!!!!**

Value for Project	Option	Cost in $ (£)	Speed	Precision & information
Highest	FTDNA Y-DNA67	$209 (£130)	5-12 weeks	Maximal
Very high	FTDNA Y-DNA37	$119 (£74)	5-12 weeks	Very high

High	FTDNA Y-DNA12	$99 (£62)	5-8 weeks	Sufficient to establish or refute that 2 BARLINGs share a common ancestor; might not give precision on when that ancestor lived
Very helpful	Financial contribution	Anything helps!		
Very helpful	Finding a male BARLING volunteer			
No use !!	Not participating			

How does one obtain the test kits?

The tests are accessible through simple Web forms:
Family Tree DNA:
http://www.familytreedna.com/surname_join.asp?code=F88434&special=true
[One needs to select the test: Y-DNA male paternal marker test & the number of markers; A group rate should be quoted]

SMGF [NO LONGER AVAILABLE FOR NEW TESTERS]:
http://www.smgf.org/pages/request_kit.jspx
[When the test is returned a family chart giving at least 4 generations is required. NOTE: this does not mean 4 generations in every line, though you should have 4 generations in the male BARLING line; If you need help or clarification let me know]